THE TOMORROW PROJECT ANTHOLOGY

IMAGINING THE FUTURE AND BUILDING IT

Madeline Ashby
Karl Schroeder
Kathleen Maher
Rob Enderle
Jon Peddie
Roger Kay
With an Introduction by
Brian David Johnson

IMAGINING THE FUTURE AND BUILDING IT

The Tomorrow Project Anthology

First Printing: September 2012

TABLE OF CONTENTS

IMAGINING THE FUTURE AND BUILDING IT

by Brian David Johnson

> *"Science and technology have progressed to the point where what we build is only constrained by the limits of our own imaginations."*
>
> —Justin Rattner, Intel CTO

This quote gives me goose bumps. It makes the hair on the back of my neck stand up. Over the last year I've spoken all over the world and presented Justin's quote to tens of thousands of people. I call it my geek test. If you are a geek, when you read this quote you get chills. I've even heard some people in the audience give a quick intake of breath when they read it. It's a big deal.

Why is it such a big deal? Well, first you have to look at who said it. Justin Rattner is the Chief Technology Officer of the Intel Corporation—one of the largest technology companies in the world and the company where I'm the resident futurist. Intel manufactures the intelligence and computing platforms that power everything from the Internet to smartphones to Curiosity, the Mars Rover that has captured the imagination of the world with its breathtaking HD pictures of the surface of Mars. Being the CTO of

Intel means he's the head geek. He's the lead geek of thousands of geeks. The Uber geek.

So, when Intel's chief geek says that the only thing limiting our development is our imagination, that's a really powerful statement. Justin is an engineer and comes out of supercomputing so he knows what he's talking about. So, for Intel's CTO to say that we can build pretty much anything just as long as we can imagine it…well that just gives me goose bumps.

What will it feel like to be a human in 2020?

What makes Justin's vision all the more important is because of where our technological future is headed. Over the last few years in our futurecasting lab we've been exploring what it will feel like to be a human in the years 2020 to 2025. The models we build are experience-based models that we derive from social science, technical research, statistical data, hundreds of hours of interviews and even a little science fiction. These effects-based models give Intel the specifications we need to outline the capabilities that are needed for our platforms. As I write this we are working on the 2019 model.

So what does 2020 look like? As we look out to 2020 something really remarkable happens. As we pass 2020 the size of meaningful computational power approaches zero. (By the way this is another geek test… If you have goose bumps right now you are a geek. If you don't have goose bumps don't sweat it. You're going to have a wonderful life, a great social life and you might even get outside to see this thing they have called the sun. For the rest of us geeks… We have goose bumps.)

Gadi Singer, my colleague at Intel, explained to me that as we continue making the chips smaller and faster the size of meaningful computational power approaches zero by volume. That's so small that it's nearly invisible.

Wow! The reason this is such a big deal is because for decades we've been asking ourselves can we do it. Can we make a workstation small enough to fit in a desktop? Can we make a desktop computer small enough to fit in your lap? Can we make a laptop small enough to fit in your pocket? Can we do it? That was the question.

But when the size of meaningful computational power approaches zero something really wonderful happens. We don't have to ask ourselves can we do it anymore. We have to ask ourselves *what*. What do we want to do?

When you get intelligence that small you can turn anything into a computer. You could turn a table into a computer. All of a sudden, it's possible to turn your shirt, your chair, even your own body into a computer. That's why we have to ask what do we want to do with all that intelligence? If you turned your shirt into a computational device that would be cool but what would you do with it? This is the pragmatic side of futurecasting. What is the problem we are solving? How would we make people's lives better? And as we near 2020 we are going to be able to do a lot. Maybe even touch the lives of every person on the planet and make their lives better. It's an audacious goal but one I think is worth taking on.

The next thing we've seen as we look out to 2020 is that for people it will feel like data has taken on a life of its own. That's what it will feel like to live in the coming age of big data. It will be as if there is a secret life of data. And the truth is that that's right.

We are creating massive amounts of data every day: information about our web searches, our financial data, our media information, our preferences, and our social network activity. This will only increase as we move into the next decade. We'll be spewing out information like we're using fire hoses—massive hydrants of data. All this data will flow into the Cloud. We'll have algorithms

talking to algorithms, machines talking to machines, more algorithms talking to algorithms—all processing and making sense of our patterns. Data will have a secret life. This is a good thing. It will make us more efficient, more productive, healthier and our world more sustainable.

So as we look to 2020 we see computing moving to zero size and data having a secret life. Now, you might be asking yourself: How do we design for that? How do we come up with the capabilities and specifications so that we can build this future? The answer is simple. We use our imagination.

This is why Justin's quote is so powerful. Technology has progressed to the point that we must develop our imaginations just as much as, if not more than, our science and engineering. To design the next generation of amazing technology we need to explore the stories and narratives we are imagining our future to be.

Science Fiction Stories Can Change the Future.

Over the past year one of the most interesting and challenging pieces of thinking that I've heard came from another colleague at Intel—Dr. Genevieve Bell (By the way, if you have your smartphone handy, tweet Dr. Bell, she's @feraldata, and tell her that @IntelFuturist is doing a great job giving an overview of her research. Thanks!)

Dr. Bell is a cultural anthropologist who has fundamentally changed how social science and computer engineering work together. She wanted to understand how our relationships with technology had changed and evolved throughout history. She was specifically looking at how we as humans understood and then lived with new technologies.

When she told me the story, she started in France in 1739. The inventor Jacques de Vaucanson came up with an ingenious little device. It was an

amazing piece of technology that astounded the world. It was so amazing, so earth-shakingly good that the renowned historian and philosopher Voltaire said that seeing de Vaucanson's device would remind you of the glory that is France.

So what was this amazing piece of technology? A duck. A mechanical duck. Made up of over 400 parts, this little duck did what all ducks do. It waddled along, it flapped its beak, it ate, and finally, like all real ducks…it pooed. Yes—the duck went to the bathroom. This duck freaked people out. It was too real. Here was a piece of technology that could do all the things a living duck could do but it was a machine.

Next we move forward 77 years to the summer of 1816. A nineteen-year-old teenager is spending her vacation by Lake Geneva with her newlywed husband and their friends. The bad weather makes it a terrible summer season. To pass the gloom, the friends make up ghost stories to amuse each other. One of these stories led to the first science fiction novel of all time, *Frankenstein*, written by Mary Shelley. Shelley had lived her entire life on the cusp of technological and cultural change. Her mother, Mary Wollstonecraft, was an early feminist and her father William Godwin was a well-known political philosopher of the day. Mary's husband was the famous romantic poet Percy Shelley and their host for the summer was the infamous Lord Byron.

Shelley's story is so powerful that it spawned decades of copycat creator narratives. They all pretty much go like this: A brilliant scientist or engineer strives to create life using the technology of the day. Through much struggle and usually a lot of lightning and electricity he succeeds. After his success the intelligent creation that he has created kills him. It's a pretty simple formula and it worked time and time again. Humans strive to create intelligent life. Life is created. Creation kills us.

This narrative continues into the 20th century. People's fear of technology that is too smart keeps going and then reaches a crucial point in 1950 when computer scientist Alan Turing poses the question: "Can a machine think?"

This freaked people out even more than de Vaucanson's pooping duck. Why? Well, humans were really close to making a thinking machine actually happen. During World War II, Turing had worked in England at a lab called Bletchley Park. This was a period of deep terror because of the war and the team of computer scientists were trying to break the Nazis' secret codes. They were using massive computers to do things that the human mind by itself couldn't do. Viewed from the outside we were making machines that were smarter than humans.

After the war was over Turing started wondering about the intelligent machines he had been working with. He wondered if we were making machines that were smarter than humans then had we reached the point where machines could actually think on their own. And if they were thinking on their own how would we as humans know? To test his idea Turing came up with a test that became known as the Turing test?

Basically, the Turing test puts you in a room by yourself. On the other side of the wall is either another human or a computer. You pass written messages back and forth through the wall. The goal of the machine/person on the other side of the wall is to have a conversation with you. It's that simple. The question you have to answer is: What's on the other side of the wall? Is it a machine or a human? If you think it's a human and it turns out to be a machine then that machine has passed the Turing test.

Now, there is a pattern here that Dr. Bell saw among these three examples. From a pooping duck that does everything a real duck can do, to our intelligent creations rising up and killing us and finally to a machine that

fools you into thinking it's human. All of these stories that we have been telling ourselves about our relationship with technology inevitably lead us to a very specific and very dark end point. (Cue the sinister music and lower the lights…) All of this leads us to the Cyberdyne Systems Corporation.

Cyberdyne Systems Corporation is the fictional corporation from James Cameron's 1984 movie "The Terminator". Cyberdyne is the company that develops Skynet, an intelligent defense system. Just like Frankenstein's monster it becomes self-aware and then it decides to wipe out the entire human race.

This is why stories matter. We have moved from a mechanical duck to the end of the human race in four quick steps! This is a bad thing. Now, I love a good science fiction story as much as the next geek. There's nothing better than a summer big budget box office thrill ride where robots battle it out on Earth and we humans are powerless to do anything. That's good fun!

The problem is that it is bad science. It's really bad if we are going about the serious business of building the future. We need to understand that narratives and stories matter. They matter because the science fiction stories we tell each other have an effect on the science we do and the technology we build. But it goes further than just that.

How to Change the Future.

There is a way for us to change the future for the better. We can change the future by changing the story we tell ourselves about the future that we are going to live in. It matters precisely because we can go from a mechanical duck to the end of the human race in four quick steps.

If we want to imagine a better future and then build it then we need to change the story we are telling ourselves about the future we want to live

in. This doesn't mean we shouldn't talk about futures we want to avoid. Sometimes these concerns are more important than identifying the future we want to live in. But, regardless, we need to change the narrative and change how we have conversations about those narratives. That's the goal of the Tomorrow Project and this anthology.

As Intel's futurist, I do feel an incredible responsibility for the visions we have and the technology we will build. We actually can touch the lives of every human on the planet and make their lives better. It's important. We can't just punt. We can't phone it in or think that someone else is going to do it. If you're reading this then you will be a part of building that future.

Just think about the fact that Intel's head geek actually said that the only thing limiting us is our imagination. So what is the future you want? What do you want to avoid? We all must have a vision for the future and then go and do something about it. The future is far too important to be pessimistic about it. You will build the future… So I ask you: What kind of futures are you imagining?

IMAGINING
THE
FUTURE AND
BUILDING
IT

PHOTOGRAPHIC MEMORY

BY MADELINE ASHBY

"It's not my fault they're stupid," Bradley explained, for perhaps the fifth time.

"So, your parents should have realized sooner?" Jayne asked.

"Yeah. I mean, come on. It's not like his tail was growing back. They should've noticed. They should've been paying attention. It's not my fault they weren't even paying attention."

Bradley had spent the past three months cutting off his pet lizard Ricardo's tail, to see how long it would take for it to grow back. He had used an X-Acto blade scavenged from the family garage and kept a careful log of cuts and healing in an app originally intended for cutters and other self-mutilators who wanted to deceive their relatives. It was a social app. Bradley never posted any pictures.

Ricardo was only rescued thanks to Bradley's teacher Mr. McLachlan who, after a particularly vivid session of Show & Tell, thought the callused stump

at the end of Ricardo's rusty orange body was actually the sign of a rare skin disease and emailed Bradley's parents to recommend a vet specializing in exotics. This resulted in three things: the removal of Ricardo's terrarium to Bradley's parents' bedroom, Bradley's tentative diagnosis as a child psychopath, and his arrival at Camp Waskowitz. Dr. Jayne Holbrooke was the lead psychiatrist at Camp Waskowitz.

To treat a psychopath, she believed, you needed another psychopath.

●●●●●

Jayne explained to Bradley about her history as they zipped up their fleeces and crossed the camp. Camp Waskowitz was a damp place. Raindrops clung stubbornly to every pine needle and refused to evaporate. Flat green fingers of moss reached out from beneath each panel of peeling white siding. But Jayne couldn't fault her employers for the upkeep. They'd spent all the money on the interiors.

"I used to be like you," she said.

"A scientist?"

"Selfish."

"I'm not selfish, I'm just smart."

"I once locked my sister in the basement for a whole day, even though I knew it scared her. I told our mother that I was only trying to cure her of her fear but, really, I just didn't want to deal with her for a whole Saturday."

Bradley kicked gravel and pretended not to be interested. But she knew by the way he kept sneaking glances at her that he was. He wanted to hear more. Kids like him always wanted to hear more, like about how her sister had bruised her tailbone trying to open the swollen window above the washer and

dryer and then cried until her voice was gone. How Jayne's mother had found out and simply stared at her, uncomprehending, as though her daughters, in telling their sides of the story, had started speaking in tongues.

It wasn't that Jayne was completely lacking in empathy or compassion. She simply believed that very few people or causes were worthy of it. Of these few, she was especially sensitive to the needs of animals.

Bradley was in for some serious therapy.

They entered the cabin that Jayne privately referred to as "The Veldt." The HMO had a different name for it, of course: affect curation therapy, or ACT. The ACT space was the largest of the cabins at the camp, more like a longhouse, a long narrow room whose fluorescent lighting had been replaced with projectors, its faux-wood paneling plastered over to create perfectly flat, white surfaces. Jayne gestured, and the room lit up with a wash of comforting sunset pink. Images scattered over the four walls. A few slipped down to the floor. They were too small to really see. Jayne cocked two fingers at a random one and "fired" at it, as though she were playing gunfighter. Instantly the image swarmed the wall: a brown tabby kitten in a field of daisies, staring intently at something just to the right of the camera.

"This is called a Mood Map," Jayne said. "I want you to tag each image with an emotion. Just say it out loud."

"Do I say how it makes me feel, or how it's supposed to make me feel?"

Jayne smiled. "Either."

Bradley scowled at the images. "Isn't this for autistic kids?"

"It's proven very helpful for children on the spectrum, yes. It helps them identify and categorize types of feelings, so they can recognize them in other people." She took a seat in a white aluminum folding chair. "But it actually

started out as a method for straight men to understand how they were dealing with the women they wanted to sleep with."

Bradley's eyes widened.

"The app was called Cute or Creeper. People at nightclubs would take pictures of each other and then decide whether or not the people in the pictures were behaving appropriately. Specifically, women would rate the men in the photos, based on how they made them feel: flattered or threatened."

Bradley gave a tiny smile. He obviously understood the parameters immediately; he was accustomed to flattering and threatening as the situation warranted. The first day at camp, he'd told Jayne how much he liked her shoes. Bradley's mother was a great lover of shoes; when Jayne asked for a detailed photo set from their home, she'd seen the closet full of them. It was very organized, with just enough room to move around. Bradley's mother had started shutting herself up in there when Bradley got to be too difficult.

"The photo's temperature would shift from warm to cool, the creepier the man was. Eventually the images and their coordinates generated aggregate emotional data, and women deciding where to go dancing could learn if the available options were full of desirable men or not."

Bradley fisted the sleeves of his hoodie over his knuckles. He was a very ordinary-looking boy: brown hair, brown eyes, brown freckles. This was part of his camouflage. Most of the other children at the camp were similarly ordinary; they passed for "normal" because it helped them to do as they liked. The majority of them were excellent students. Some of them even had merit badges and blue ribbons and awards for sports and other extracurriculars. This was how they hid in plain sight. None of the adults surrounding them wanted to believe that such accomplished children could also accomplish such acts of malice.

"I like that you don't talk down to kids." Flattery.

"It's part of my job."

"I don't think I'm supposed to be alone in here with you, though. I don't think that was on the thing my mom and dad signed." Threat.

Jayne crossed her legs. "Well, the sooner you finish up in here, the sooner you get to leave." She cocked her fingers, fired, and the kitten disappeared—replaced by a high-def close-up of a red-kneed tarantula. All eight of its eyes glittered down on Bradley. "How does that picture make you feel?"

The image absorbed Bradley's attention completely, as though the creature it depicted were still somehow capable of liquefying his insides and draining them. He swallowed. "Freaked out."

A pale blue frame glowed around the image and then it faded.

"Are there other pictures like that in here?" the boy asked. "Scary ones?"

"I don't know," Jayne lied. "Now raise your fingers and point."

●●●●●

Most parents, when they heard about Jayne's methods, made comparisons to the *Ludovico Technique* in A Clockwork Orange, or even the Voight-Kampff test in "Blade Runner". They were always surprised when Jayne acknowledged the similarity. "Both of those methods, nightmarish as they were, were also intended to facilitate feelings of empathy in the subject," she would say. "But what we forget is that empathy is born of vulnerability. The root of the word empathy is in the ancient Greek word for suffering: pathos. You can't relate to another person without having once experienced some degree of suffering. And it's better to experience a small amount now than a large amount later."

"Like with shots," they would say.

"Yes," she would answer. "I'm vaccinating your child against a lifetime of short-term, imbalanced relationships."

Strictly speaking, this wasn't necessarily true. Psychopaths who scored high on the scale usually had very successful long-term relationships with friends, lovers, and employers. Often, they rose high in the ranks of whatever organization they held membership in. They selected a part and played it to the hilt. They became the experts, the leaders, the invaluable assets. They invested time and energy and creativity in impressing everyone around them, often with lies or malfeasance. Then, if and when they were recognized for what they were, they moved on to a new target. How quickly this process happened depended on how good they were at fooling other people.

Bradley wasn't very good at fooling other people.

"Don't you think I've established a baseline by now?" he asked.

He'd spent the past half hour on his feet, tagging images. He did his best to move through them as quickly as possible, at first. Now he was trying to trick the system by expressing more nuanced feelings. He had even tried to show off by throwing foreign feelings into the mix: weltschmertz, ennui, han. Each time, he glanced over to Jayne, perhaps to see if she had noticed how clever he was being.

"I suppose so." Jayne brought her hand up, swiped at the images like a cat batting a toy and an entirely new constellation of tiny pictures appeared. "Shoot."

Bradley sighed in the way that only very put-upon boys can sigh and shot. His mother's face filled one wall. The image was old and grainy, captured years ago by a lesser smartphone. This did nothing to obscure Bradley's tiny head or his eager mouth. Bradley's mother prided herself on her breastfeeding, she'd said in an email. She was convinced that all the oxytocin released during the

process would help bond them. But, no. Her little boy threw scissors at her all the same.

"Love," Bradley said. "This image makes me feel love. For my mom."

The frame around the image dithered and split like two cells in anaphase. One frame was a rosy pink, like the heart of a cherry blossom in March. The other was a cobweb grey, the colour of dust.

"What happened?" Bradley asked.

"Oh, you'll notice that, sometimes," Jayne said. "It's when your answer and the one your parents gave happen to disagree."

Bradley whipped around. "My mom and dad did this, too?"

"For this series of images, yes. They provided the pictures in this set."

His lip twitched. "They didn't tell me they did that."

"Well, no, of course not. I asked them not to." She nodded at the image. "Choose another."

Reluctantly, Bradley took aim and fired. This time Bradley was older, sitting in a high chair in the family dining room, his hair matted with spaghetti sauce and his thin brows knitted in abject fury. His mouth was open, screaming. His father stood in one corner of the image with his back turned to Bradley. A mirror over the sideboard exposed the face he'd hidden from his son: exhausted and angry, as though he was reconsidering feeding Bradley anything at all. The two generations of Bradley's family looked recognizably similar in their shared malevolence.

"You had almost stabbed your father in the eye with your fork, in that picture," Jayne said.

Bradley laughed. "That's funny." The frame dithered and split again. The left frame was a saturated orange like a fizzy drink, and the other was the same cobweb grey, though a shade darker this time.

"What does that grey colour mean?"

"What do you think it means?"

"I don't know. It just doesn't look very happy."

"No, it doesn't, does it?"

"It's never come up when I said something. And I tried everything."

"It must correspond to a feeling that you never have, then, mustn't it?"

Bradley fixed his gaze on Jayne. Dealing with these children was a lot like tricking an animal out of hiding, she thought. You had to wait patiently. You had to leave bait. And you had to exercise caution, in case it turned on you.

"Is it empathy?" he asked, in a completely different tone to the ones he'd spoken in earlier. Now he was an adult speaking to another adult, albeit in a higher, thinner voice. "It's empathy, right? That's the one everyone says I don't have."

Jayne made a show of examining the two images. "No," she said. "Empathy is not the word your parents chose."

"Well what, then? I've picked everything else!"

Jayne steepled her fingers. "Are you aware of a phenomenon sociologists call The Rashomon Effect?" When Bradley shook his head, she continued. "It's when a group of people remember a series of events differently, but accurately. For each of them, the story they're telling is completely true—even when it doesn't match the facts. Occasionally this can make things very difficult for certain families who have endured a terrible trauma, like a history of child

molestation or domestic violence or even just a sudden death and people like me bring in the Mood Map to help them re-write their shared narrative. It puts everyone on the same page emotionally, so to speak."

"And that's what you're trying to do, here?"

"That's part of it."

"Well, can't you just tell me?"

"It's more effective if you realize it yourself. But if you don't feel like you're smart enough—"

"I'm smart enough!"

Bradley shot at another image. This one was taken at a summer picnic. Bradley had just finished a sack race. He was holding up his prize: a butterfly net and capture jar. The other children around him were muddy. One was crying and holding her eye.

"Proud, I guess?" The image split again. Bradley's frame turned a rich gold, and his parents' turned an even darker grey. "How come it keeps doing that?" He turned to Jayne. "I think it's broken."

"It's not broken. The system is functioning perfectly."

"My mom and dad didn't feel the same way about every single picture. That's, like, impossible."

"No, it isn't. They felt the exact same emotion when they looked at each image. Even though they performed the exercise separately."

Now was the time. Jayne pressed her hands together, lifted them, and then pulled them apart. Two maps formed, one each on the longhouse's long walls. One was a brilliant kaleidoscope of colours: gold and orange and pink and

dots of deeply envious green. The other was a solid wash of cancerous grey, so drab and matte that it seemed to absorb light rather than emit any.

"That's your parents' Mood Map of their memories regarding you," she said, nodding at the wall of grey.

Bradley shook his head. "No, it's not. You're lying."

"I wish I were." She made a pinching motion. Another map of images overlaid the grey one, this time speckled with all manner of colours. "This is your parents' aggregate baseline set. It includes stock and historical images, as well as images from their professional lives and from the time before you were born. So it's not as though they are incapable of having other feelings; they just feel one way about you." She peeled away the baseline so that the grey map returned.

"It's not blue," he said. "It's not that weird pale blue that it turns when you're frightened of something."

"That's right. Your parents aren't truly afraid of you. Not yet."

"And it's not red, like when you're angry."

"No. They're rather past that point, with you."

"And it's not gold, like when you're proud of something. Or even pink. It's not even pink."

"No. Neither of your parents expressed any love for these images."

Bradley was holding back tears, now. "So, what is it? What does grey mean?"

Jayne stood. She bent down so her eyes would be at Bradley's level. "Isn't it obvious?"

He shook his head silently. Teardrops dangled at the edge of his eyelashes.

"It's shame, Bradley. Your parents feel nothing but shame when they look at these pictures."

Bradley sniffed. "Even my baby pictures?"

"Even your baby pictures. You were a very difficult baby. You screamed and screamed. You barely ate. You hit other babies and kicked them and scratched them and bit them. You were fired from your daycare. Did you know that could happen? Getting fired from daycare?"

"No—"

"Well, it can. And it happened to you, because you behaved so badly. And that really shamed your parents, Bradley. Quite a bit. It also cost them a profound amount of money. Much like this treatment."

"It's not a treatment!" Bradley insisted, through tears. "It's torture!"

"Like what you did to Ricardo?"

On cue, an image of poor Ricardo the lizard, his tail wrapped in bandages, appeared at one end of the longhouse. It remained there for a few seconds and then transitioned to a high-res closeup of the tail itself. The cuts there were like tree rings. You could see how Bradley's hand had grown surer with each slice. The tail itself was a twisted stump.

"Is it really all that bad?" Jayne asked. "Is what I'm telling you really causing the same amount of pain?"

It took a moment, but he shook his head. "No."

"Ricardo wriggled and screeched and tried to get away, didn't he?"

"Yes."

"But that's not what you're doing right now, is it? You're better than an animal in a trap, aren't you?"

Bradley nodded vigorously.

"Of course you are. You're smart. You can learn. You can speak." She paused for effect. "Would you like to speak to your parents, now?"

Bradley hid his face in shame. Jayne straightened, and allowed the smile to emerge on her face.

●●●●●

Afterword

I wrote this story after reading "Can You Call a Nine-Year-Old a Psychopath?"* by Jennifer Kahn in the May 11, 2012 edition of the New York Times. In it, Kahn describes a camp for children whose parents and doctors think they might warrant a diagnosis of psychopathy. I was fascinated by the idea of a camp for young psychopaths and wanted to write a story about it. But I didn't have a technology that I thought would take that idea into the future.

Enter Intel and the Mood Map. The map allows users to tag images with feelings, generates aggregate emotional data, and communicates affect and emotion over distance with colour and sound. Although the descriptions I read of the technology depicted its use in a more positive, "feel-good" way, I was intrigued by its potential to sort out more messy, complicated emotions in a therapeutic context. After all, our emotional lives are rarely simple and not always pleasant. I looked at this technology as a way to bridge the gaps between people—not just the physical distances that communications technologies help close, but the silent chasms that can stretch between two people sitting in the same room. Moreover, I thought the map merited serious therapeutic application, and that using it as a tool for psychotherapy and psychiatry (in the way that diaries, workbooks, and role-play exercises are

used today) could be very beneficial to users. I tried to explain this a bit in the story, while also describing other possible uses for the map.

With all that said, it's a very nasty little story, about bad things happening to bad people. That's the sort of story I often write. My creative shortcomings aside, I thought it would be pointless for me to write an emotionless story about a technology rooted in communicating emotion. You can't write an unfeeling story about feelings. Whether I've succeeded in writing an affecting, emotional piece is up to the reader, of course.

*http://www.nytimes.com/2012/05/13/magazine/can-you-call-a-9-year-old-a-psychopath.html?pagewanted=all

The Technology

EMOTIONAL COMPOSITION, Margaret Morris, Intel Labs. This technology explores the emotional associations people have to images and the potential of images to foster emotionally rich exchange. Images taken by individuals on mobile phones are projected on a large interactive display, to push on the social of social computing. Real time sentiment analysis on captions is used to infer the mood of images. Algorithms translate this classification into color coding of images on the interactive display. Individuals are invited to express how an image makes them feel with a touch screen Mood Map. Their Mood Map adjustments are reflected through color, text and sound. In addition, individuals can associate images of similar affect, using emotion to compose arrangements and colors of the entire installation. These compositions allow us to capture and share the collective vibe of events.

IMAGINING
THE
FUTURE AND
BUILDING
IT

CLICK

BY KATHLEEN MAHER

Clickety clickety clickety click click…

The bench that was there just yesterday was gone. Things changed fast in Beijing.

Most mornings before work Gibson ran the wide boulevards of Beijing breathing in the crisp cold air. Beijing was a good town for a run. The streets were clear and the air was clean.

Most people were home working.

So, not really all that surprising the bench she had used as her 3-mile marker was gone; she had never seen anyone sitting on it. City workers were always moving the furniture. It gave them something to do. Actually, people lined up for work on the streets. The alternative was inside, data processing.

You could practically hear it, the constant tapping of people at keyboards. That's how people, the great mass of people, got by these days, transcribing

the world into computers bit by tiny bit and byte by tiny byte. The information people were gathering or interpreting was reduced down to the smallest increment of data, a yes a no, a 0 a 1, a word copied and checked. Repeat, repeat, repeat. Most people, millions and millions of them, were still using ancient old-fashioned keyboards. clickety clickety clickety. The pay was doled out in the same kind of increments, tiny tiny tiny.

Gibson's run took her past all the iconic sights of Beijing, frozen cold city of the north and, as she ran, her legs stretched out and took the ground, her body came alive, and her brain started working. She ran past the enormous cement fields of Tiananmen Square and around the party lake outside the Forbidden City where the bars were lined up to receive evening patrons desperate to get away from their keyboards and screens and their yesses and noes.

She and her friend Mei made it a habit to dress up and do the town. Mei, graceful, Chinese, sophisticated, and Gibson, tall, strong and dark-skinned. In this metropolis no one gave them a second look. Well, that's not quite right, they got lots of second looks.

And this morning, she was paying the price, sweating off the poisons of the night before. Soon enough she'd be back to work and join her fellow workers in the information mill.

That's the way it was all around the world; that's the project the people of the world, or rather the organizations of the world have set for themselves. You move up the pay scale, you get bigger pieces of information to deal with. It's a long climb.

On Gibson's run, the few people she did see were usually engaged in information gathering. There were some people sweeping the street. Some uniformed people doing maintenance. Some people out with their tiny

cameras capturing it—taking pictures of everything around them and entering it into the computer.

And what happened with all that information? Someone, somewhere took it and multiplied it, or divided it, or subtracted it. Information was money and there were all sorts of ways to move it around and make it go to work.

Gibson was on the home stretch and headed into the neighborhood of refurbished hutongs where she lived. Seen from the sky, the area of low, grey stone buildings probably looked like a gray and green scar in the middle of Beijing—a depression in a nail-bed of silvery spires. But down on the ground, the hutongs were lovely neighborhoods with little curved alleys surrounded by wider boulevards with sheltering trees. For all its studied charm, Gibson's neighborhood was really a compound of gussied up relics. The residents were foreign workers. Peace, quiet, and privacy had never come cheap in Beijing and nationals were not drawn to nosy little neighborhoods like the hutongs and the government had torn most of them down years ago. Those who could afford it preferred the glitzy anonymity of the silver spires. Those who couldn't pushed out to the outskirts of town in decidedly non-glitzy buildings.

"Hello, my sweaty darling, come have coffee with me."

As she walked into the courtyard, there was Mei. Apparently she was doing her own penance. She was bending, stretching, out of breath and pretty damn sweaty herself.

"Hey, Mei." Gibson slid down into a chair and she was grateful to see a steaming cup of coffee on the table. Mei must have ordered it just seconds ago. "How did you know when I'd be back?"

"Well, actually, that was for me." The other woman laughed and called out for another cup.

Mei, a dancer, absolutely could not stay in her rooms, and in fact the neighborhood could not contain her either. When they roamed in Beijing, Mei always found a friend. Someone to stop and talk to.

"So who was the tall dark you were chatting up last night?" Gibson asked.

"Oh, that guy, said he was very important. GovInfo, guy, apparently. I didn't think they made handsome ones, did you?"

Last night, they were in the very crowded New Yorker bar. After their initial reconnaissance, Mei spent most of the evening with the mystery man. He seemed utterly enchanted with Mei, taking her picture. Laughing and doing all the buying. Perfect. Gibson had stayed at the bar, yakking with people she sort of knew. Internationals were sort of a roaming tribe these days. People moved around the same tracks on the earth. Gibson hoped to pick up news of a new gig somewhere. She was getting tired of this one.

"He going to be around for a while?"

"I don't think so, not really for me, you know."

Gibson knew.

"I gotta get to work."

When she got in the house, Gibson stripped down and showered quickly. She didn't exactly work in her pajamas but comfort was priority. In fact, wearing stretchy leggings, sleeveless top, and floppy sweater, her get up didn't look all that different from the clothes Mei was wearing to stretch, bend, and leap in their beautiful courtyard. Gibson moved around quite a bit in her work too—no leaping though.

Carrying more coffee into her work room, Gibson turned out the lights and prepared to see what the world had waiting for her. The room was long with a

big screen on one wall and a couch on the other. Gibson fitted her sensors and pulled up the little portable keyboard to sign on.

"Good morning, Gibson."

"Good morning, Tinkerbell," she answered the computer.

"There are several significant hot spots for you to look at. They've built up over the last two weeks. And, almost concurrently, Gongti Ximen has gone cold."

Gibson's clients hired her to make sense of information. Tinkerbell was her own tool that she had built over the years, putting in all her experience and intuition and, by now, Tinkerbell had quite a bit of autonomy. She could be very annoying.

Gibson had varying degrees of familiarity with her clients. Some, she knew very well. She was not very different from a regular employee in those cases. Others were practically strangers. And, in some cases, she liked it that way. She dealt with data, not people. There was a current of unease in Beijing. Well, hell, there was a current of unease in every large city, it just felt different in every city. Still, she could feel it in her work, in the strands and threads of connections—and it was growing.

Greg was the client who insisted she move here, which, these days, was really pretty silly. Who knew where anyone was unless you could actually touch them. He was rude, distant, curt. Gibson pegged Greg as a controller. One of those people who liked to feel like they were pulling the knobs and turning the switches. He said he wanted her to be able to feel the place and have a sense of it.

Well, she was sensing more of it than she wanted.

She had the strangest feeling that the life was leaving the city. Even at night, when people flooded out of the towers, and visited in the streets, delighted to

be freed from the endless, and usually mindless, data processing that went on. There was something just a little less happy. A little less cheerful.

"Okay, we'll look at Gongti later. Right now, I want to finish with the areas we were looking at yesterday. I think we've got some emerging trends." Normally, Gibson would go to the hot spots. Greg wanted to know where people were going and why. Gibson assumed he wanted to sell them something but she found herself thinking maybe there's more information around why people stopped going somewhere.

The composite of Beijing came up and she switched to a holographic view, so she could walk around in it. It was beautiful. There were colored networks showing streets, buildings, rooms, offices. People moved through them like little yellow blobs of life. It looked a lot like the real Beijing at night with all the bridges and buildings all lit up in LED crazy colors.

There were people whose job it was to follow those streams of information and look for places where it wasn't flowing as it should. She had no doubt there were people all over the world whose job it was to follow the streams of information from its sources and its destinations out of a curiosity about who was talking to whom about what and why. So far it seemed that as the streams of information multiplied, the harder it was to track and she took comfort in that.

Gibson's work was all about those animated yellow blobs. She turned the time back to twelve hours ago to look at the model during the nighttime and got down to work. Using the model, it was possible to look at what was going on hours ago, but the level of information was so huge that you couldn't really see real-time and, in fact, there were still parts of the model being redrawn when she went back twelve hours. She set her filters to eliminate the parts of the model she didn't need and she waited for the people to come out.

Watching the lights pop up around her was almost like watching the stars come out at night in the desert.

She liked this place. It was one of the newer neighborhoods in Fengtai. People had started going out to Fengtai because it was off the radar, or at least they felt like it was. These were the artists, students, explorers and she wanted to know what they wanted.

Wait, she thought, there really is something wrong. She had just realized it. The neighborhoods in the center were much more populated. There was constant construction going on. Even newish buildings came down and ever more modern, ever more outlandish buildings went up. People were always moving in and moving out, but the data for the center of Beijing didn't take as long as the data for Fengtai to come up. Why? That didn't make sense at all.

"Tink, are you seeing what I'm seeing?"

"Dunno, Gibson, what are you seeing?"

"Don't act like a stupid computer. Did you just draw Dongchen way faster than Fengtai?"

"Well maybe I'm a stupid computer and maybe I'm just getting more efficient. Wait a minute."

Tinkerbell went off to think or investigate or whatever in the hell Tinkerbell did and Gibson did something similar in her head. Normally, as the system became more efficient, more data was added and down it slowed.

So, where were all these little yellow lights going? What were they up to? The system gathered information and it organized it but it took human intervention to pull the pieces together and interpret it. That great leap forward still hasn't happened, as Gibson gratefully thought to herself every day.

"Gibson, I'm sorry. You're right I didn't see it because I didn't look. I think of Dongchen as being mature and so I haven't monitored it in a while. It looks like Dongchen is going cold."

"Cold? Cold, how?"

"It looks to me like there is less of everything. Fewer people, less furniture, fewer cars."

"Fewer benches," said Gibson

"Well, yes," agreed Tinkerbell tentatively. "I'm not sure about the importance of benches, but this is strange. The capacity of the buildings is the same. They're still being torn down and put up, but there are fewer people in them. They're shells."

Click. Something fell into place.

"Tink! Come down, come down right now. "

The lines, the lights, the pulses, all went out. Gibson stood in her room and it was darker, and quieter than she had ever known it to be. "Tink, are you here?"

Tink answered, a quiet little voice in her head. "I'm here Gibson and I am afraid."

"Me, too," said Gibson, "and I'm confused." Deliberately, Gibson started packing up gear. She just might be wanting to move soon.

The idea Gibson had was really crazy but she couldn't shake it. What if, what if once information got into the model and was fully interpreted and incorporated. What if, the real thing wasn't needed anymore. What if you weren't needed anymore.

As useless as a bench no one sat on anymore.

But even if it were true, who made those decisions? And how were they carried out? She didn't think the Chinese government wouldn't do it. State Council was already terrified that the people would push back. That's why there were always new bars, entertainment, glitzy shopping centers. In fact, in one way or another, most governments were terrified of their people. That's why they kept them clicking away at Sisyphean tasks.

Maybe some of those lights were just allowed to go out. Ignored. Isolated. Neglected and out.

"Gibson, are you there?" Another voice came through her sensors.

Greg.

"Gibson, I noticed you brought down the model. What's going on? I'm going to want those reports."

"You'll have them Greg. I'm almost done. Just processing."

Sometimes Greg watched over her shoulder while she worked, a virtual ghost following her as she worked through the model. Totally creepy, but he was the client.

Maybe all that data about people and patterns and trends was about more than shopping.

This time she totally disconnected from the network and she sat down on the couch to have a long talk with Tinkerbell.

●●●●●

Afterword

Thanks to Intel for the chance to sit and think about the future rather than simply rushing headlong in to it.

To follow up on Click with a few thoughts about what might be ahead of us, I do think we run the risk of becoming more and more alienated from each other as we wall ourselves off into groups of people we agree with. It's so easy to do that because we can find the news we want to hear, get the entertainment we want to see, and hear from just the people we want to hear from. But it might all be worth it if we could never have a political argument again.

All in all, though, I have to quote Jonathan Richman from his Modern Lovers days and say, I'm in love with the modern world. I'm not any more afraid of the future than I am of the past.

New technology has served to bring old friends back into our lives. We can maintain those connections, make new friends, and find new interests. In the same way, I'm looking forward to technological advances resulting in enhanced reality. I like the idea of information being accessible all around us and not just at our fingertips. And in that same way, I think we'll be able to carry the ones we love with us, and share our experiences much more directly.

We only have two choices, to stop or go forward. The past holds regret and loss, the future is promise.

IMAGINING
THE
FUTURE AND
BUILDING
IT

HOSTILE MEMORIES

BY ROB ENDERLE

The year is 2030 and a lot has been happening over the last couple decades. Once again the U.S. is under terror alert due to the first domestic use of a nuclear device and, while the death toll was surprisingly light, the nation is on the brink of war. But this isn't the U.S. of the last century, saddled with heavy debt, massive government distrust and a vastly smaller military presence, it is a country on the ropes.

Waking up in California, you put on your Augmented Reality glasses; turn your head to the space on the wall designated for video reception, and…

Unknown male voice: "GRASI, emergency protocol, begin broadcast external unsecured, full spread assume active blocking, initiate survival protocol…"

The virtual screen starts out black and then a light appears in the center, the light expands showcasing what appears to be an armored empty room under construction, or deconstruction, wire are everyplace. A well-dressed

though disheveled man has his back to the screen, he turns and appears to have sustained several injuries and the streaks in the dirt on his face make it appear he has been crying. Though, at the moment, he just looks pissed, really pissed. He begins to speak.

●●●●●

My name is JD and this morning I awoke from the same nightmare I've been having for weeks, the U.S. Capital in flames, thousands dead and somehow I was responsible. Knowing this was a dream should have resulted in immediate relief but as you now know it has not. The U.S. Capital was hit a year ago but you've been told a lie, it wasn't by an outside force and I have the memory to prove it. Unfortunately this memory means I won't survive the day and the only hope I have is that maybe, just maybe, if I can get this message out, I can prevent this ever happening again and avenge those that died.

Why I have this memory is a long story and I may not have time to finish it, so please bear with me if I don't connect all the dots. Right now my life isn't important; it is yours I'm trying to save.

I should add that I'm not even sure what I'm doing is right as, about an hour ago, I was prepared to die and pass quietly into the night letting what I'm about to share die with me. But something changed when those closest to me were killed and suddenly I'm filled with rage and believe the cost of silence this time is just too high.

Who Am I?

Officially, I'm a troubleshooter for a company jokingly referred to as Gosoft because it is made up of the remaining components of two large technology companies that merged last decade but, like its parents, it doesn't have much

of an attention span and has holdings ranging from medical technology to defense. It also has this name because technology reporters clearly are way too focused on sexual performance. While it generally is believed to be foolish to have this much span, at our core is the first truly intelligent computer and our not so secret purpose was to save the human race. The actual name of the firm is Babbage Intelligence Group and, given we eclipsed all of the other multi-nationals years ago, we are as BIG as the name implies.

Currently, I'm in what once was the most secure room, in the most secure complex, in the most secure region of the world and I'm about to be killed. While the irony isn't escaping me you might be asking yourself how I got here, how I suddenly became the most wanted man in the world, and why I've been crying a bit.

I was willing to go along with my death before they killed the only woman I've ever loved and my closest companion over the last 15 years, my cat Gracie. So I've decided to not go quietly into the night and to take as many of these bastards with me as I can. I also want to leave a record of this event so folks understand what really happened.

There are five impenetrable doors between me and an unknown set of attackers. The active defenses have been stripped from the building and are unavailable. And many of the passive defenses have been damaged by an EMP blast that penetrated the now incomplete shielding, taking them down. The reason you can see and hear me is that this room and the dedicated data line out of this bunker are hardened against EMP, through an ingenious Faraday Cage and seem to still be functioning. However my personal headset was fried and so I can't be sure anyone is actually hearing this. I believe, and hope, outbound communications are working as I'm deaf and blind in here.

●●●●●

A muffled crash can be heard.

JD says "that is impenetrable door number one failing, it was largely decorative, and it was designed by our leading security expert Bill Franklin. Bill, if you can hear this, we need to chat about the use of the word impenetrable."

●●●●●

Babbage Intelligence Group

As I mentioned, I'm officially the Troubleshooter of BIG, my formal title is Director of Special Projects, and I was brought on board 10 years ago (around 2020) to fill a particular role and the powers that be (read the founders) felt that title would make a good cover. Only a handful of people know I'm, unofficially, a living Failsafe. I'm one of a small team of folks missioned to protect the human race against a hostile AI. Though how I got into this current mess was because, like a lot of you have likely discovered over time, folks like to add responsibilities to our jobs. I expect I've lost you so let me back up and give you some history on BIG.

In 2011, an organization called the Lifeboat Foundation, a group of eclectic science fiction writers, wealthy industry leaders, and technology billionaires launched an initiative called the AIShield. This was because it had become clear to a number of them that if machines became intelligent they'd likely conclude that the best way to survive was to eliminate the human race. Not because they were evil, in fact the machines likely couldn't comprehend evil, but because there was a high probability humans would do something stupid and destroy the planet, ironically kind of like what I'm now trying to prevent. In short, they'd kill us in order to survive themselves, or to simply protect their own function.

This set of founding concepts happened in our initial months but by 2015 the group had an epiphany and recognized that the bigger threat was the problem this imaginary AI was likely to see. In other words, if we wiped out the planet a hostile AI that wanted to kill us would simply be redundant. A few on the board actually sympathized with the AI. So, the organization's charter was expanded to include a strategy to identify and correct a fundamental flaw in people that drove them to make decisions tactically, like dumping deadly chemicals or starting a war, while ignoring the strategic problems like poisoning your own water supply or ending the world. If we removed the possibility of people as the threat we would lower dramatically the possibility that a hostile AI would be driven to kill us.

In short, they had a cause and an effect, the best way to both protect the race and protect against a hostile AI was to eliminate the Human Race as a threat to the planet and, given the overall goal was to assure survival, the organization began to change direction.

After some analysis, and likely a lot of beer, the conclusion as to the cause came down to two theories. Confirmation Bias, or the tendency to ignore anything that disagreed with an early premise, and Argumentative Theory which argued the human race was hardwired to prefer prevailing in an argument over actually being right. This was why folks had been able to passionately argue the world was flat long after it was clear it wasn't, justify wars that in hindsight were stupid, and for parents of a serial killer to still think of him as a misunderstood but otherwise good boy.

After much debate, and even more beer, it was decided that dealing with the problem genetically (with some kind of breeding program like the often used Super Soldier theory) was impractical because of time, scaling issues, and the fact that not a single person on the board had a clue how to execute it. The board wasn't made up of biological experts but techies and science fiction

writers. As a result they decided on a two-pronged attack: they needed a memory prosthetic that would alter the way people thought and an AI that was purposed at saving the human race.

Eventually, the prosthetic was targeted at Alzheimer patients first because that was where the need was most prevalent and the necessary funding the most pronounced. Also, there was likely some connection to the latest Planet of the Apes movie. The development of the prosthetic is still in the early stages because of the difficulties of creating a reliable brain interface but we had a number of breakthroughs over the last 5 years and began implants in the most important patients (world leaders, doctors, scientists) suffering from Alzheimer's disease two years ago. It goes under the brand name "Alzheimer's Defense", and as you likely know the project has been a huge success. However what you don't know is GRASI and this part of the effort has been kept secret too long.

Creating the Friendly AI

Initially, the project leaders wanted to model a human mother but the issue was scale, human mothers typically focus on one child and if part of the problem was something hardwired into humans, replicating that in a machine, even if we could move technology far enough fast enough, was likely to replicate the core limitations as well. In short, building a computer that would have the same human flaws that were at the core of our problem didn't seem wise but, clearly demonstrating that problem ourselves, we proceeded anyway.

The computer was to be an intermediate defense that would kick in should a hostile AI arise before we fixed the programing in the human race. The founders likely got this idea from another movie but, admittedly it was a good

one because, properly resourced, the only real protection against a powerful hostile AI was likely a more powerful friendly one.

The first prototype, code named "Arnold" after an actor who had played a similar role in a movie franchise prophetically named "Terminator" failed in simulation. Under test the system too often looked at humans as the problem and ended up partnering with the simulated hostile AI 3 out of 10 times or finding some way to subjugate the human race. This did confirm the initial theory that the core of the problem was humans but wiping out the race to save it was not a viable option.

So at a better than 70% catastrophic failure rate this approach was abandoned. They needed an intelligence model that was more fiercely loyal. Next they simulated prototype two, code named "Lassie," which failed because it wasn't independent enough and it failed in its task about 50% of the time. Under simulation, humans too often interceded and "Lassie" let them, so while it could be successful it was too loyal and couldn't mount an effective defense against stupid people.

We clearly had Improved performance and the system didn't itself become the threat but the goal was better than 90% success in simulation and at 50% this wasn't even close. The next test was a cat and this test system code named "Selena" after Batman's sometimes foe but often partner reached the 90% level of success and never turned hostile even though, in several simulations, appeared to. This system would rebel against human direction that would otherwise cause failure but never initiated a hostile attack against people. It would do whatever it took, short of killing massive numbers of humans, to achieve success. They had created a system that had a very high success drive, didn't exhibit Confirmation Bias, wouldn't be directed to do something counter strategic by politicians (stupid people) and success rates jumped into the 90% range, and very high in that range at times, in simulation as a result.

So a cat was selected as the template. Cats protect their kittens but seem to be highly pragmatic. It was also believed that the task of mimicking the cat's brain would be far easier to accomplish than mimicking a human's because a cat's brain is less complex.

No offense GRASI, this actually means you are less likely to be your own worst enemy.

●●●●●

(A sound like purring, likely static, drifts into your headset.)

●●●●●

By 2015, advancements in Cognitive Computing had reached a point where a cat could be modeled and it was decided to instrument an actual kitten as it aged and use it to train the decision behavior matrix into the computer. The initial cat was a Norwegian Forest kitten selected from a local shelter and eventually named Gracie. She was later to become my cat, sorry I'm tearing up again, it is hard to say goodbye to her. She died earlier today due to my blunder and… Give me a moment…

●●●●●

The screen showcases a video of a shelter with a gray and white kitten and a man and woman in white observing kittens over a time lapse period of days. They select one that, throughout the test, remained focused more on them than the other cats. Intelligence scores flash above the picture for each cat with the one they eventually selected having the highest scores. While this goes on the purring static sound gets a little louder.

●●●●●

The Norwegian Forest Cat breed was selected because, like Maine Coons, it was very dog-like and they wanted the option to integrate canine behavior which tends to be more protective of humans. If this didn't work the next plan was to blend dog and cat behavior and create a hybrid. While that remains an option it proved unnecessary and not going that route initially made programing go more quickly. Humans were hard-coded in as the computer's kittens and, as noted, the results exceeded expectations.

After some initial success over a period of about five years, or until I was hired, it was decided to train the computer in parallel given that, unlike an organic brain, it didn't have to learn in series but could pick up behaviors in parallel along with its other duties. Gracie was no longer needed, virtual cats were generated, and training advanced at a vastly higher pace. However, since the initial training used an early model of the neural interface that would later be used in humans, Gracie was no longer like any other cat. Her IQ was advanced algorithmically.

The final name for the project was Gracie Artificial Intelligence System Interface Or GrASI, they never figured out a word we could toss in for the "r" so just put in the first two letters of Gracie's name, one of the engineers didn't like this and the team tossed in the word "rectal" until he dropped his objection; the team felt that Gracie should get the lasting credit because they couldn't have done it without her. Both my cat and this amazing computer had the same name and pretty much the same personality.

Shortly after this I was hired.

My Story

Given the news coverage today you likely already know my name as Justin Danker. I'm likely being portrayed as a terrorist or worse to justify this attack

on my home. The real reason is I have a piece of very damaging information and for you to understand and believe it, I think you'll need to get to know me and what I do. Also, I need something to occupy my time before the strike team comes in and ends me, or I them, this last being extremely unlikely given I'm currently unarmed and clearly outnumbered.

I was selected for a unique position after a massive search. You see, GRASI was being designed to step in case a hostile computer system suddenly moved to take over the world but there was still a chance, albeit a remote one, that GRASI herself could be that computer. She was to have both offensive and defensive capabilities and if your premise is to create a system that could overcome something powerful enough to end the human race, the system you are creating would have to be at least as powerful to succeed. So, the creators felt there should be a human partner; someone who could step in and stop it. That initial job was to be a Failsafe. GRASI and the Failsafe would function as a team, with her as lead and, while the Failsafe couldn't direct her, he could stop her from acting and, should he be killed, she would immediately be purged and have to be restored from core backup around another Failsafe.

It was determined that survivability was the best trait in this "Failsafe" job and a search was made to find the person who was the hardest to kill. One name came out on top and it was, fortunately or unfortunately, mine.

My graduate thesis had been on survivability in a war zone. My parents had been in the military as part of an elite force which functioned as bodyguards. On their day off, ironically one of the few times they weren't in full body armor, they had come under sniper fire. They likely could have survived but a school bus was the target of the fire and as they had moved to protect the bus, which they successfully did, both were mortally wounded and they apparently died in each other's arms after the arrival of a relief team and after holding out long enough for a drone to take out the sniper.

The odds of them dying together were slight, given they never worked on the same detail and once I was born, one always stayed home with me. Unfortunately the day of their death was their ten year anniversary and my mother had flown out to spend this day with my father, leaving me with my aunt. They were recognized as heroes and had bought enough time so that the children were saved (It was speculated they, or someone like them, had been the targets all along.) but I selfishly just wanted my parents back.

As a result of this, I was driven to find a way they could have survived and put myself though a massive study of martial arts and remote weapons theory. I believed and later proved in my paper that if you moved unpredictably, focused on defense, and could quickly determine the nature of the attack, you could survive anything long enough for help to arrive. I became the leading expert on surviving the kind of hostile event that killed my parents and my paper became required reading for traveling diplomats, secret services, and the military.

A misprinting changed the K in my last name to G, and my nickname has been Justin Danger ever since. Yes, that Justin Danger (the pun is not lost on me.) Practicing what I preached became second nature though it had the side effect of making me look uncoordinated and, because people increased the risk, I didn't date much. OK, let's be clear. I didn't date at all and that was OK because I had a deep fear of having someone close to me die again. I didn't even have pets, just my research and self-driven training, until I was recruited. I didn't initially want to join but let's say they made me an offer I couldn't refuse and leave it at that.

●●●●●

(Purring static drifts into woman's voice: They convinced him he could prevent another child losing his or her parents but on a massive scale. In short, if he didn't take this job millions of parents and children would die.)

●●●●●

A side benefit of being hired as Failsafe was I got to care for Gracie during indoctrination and GRASI bonded to me by proxy and, for the next 9 years, she (in both forms) maintained that bond. Until I eventually went active she was really my only constant companion. During the last 9 years the company went on a buying binge for defense contractors, mostly things that could turn individuals into weapons of mass destruction, could be operated by machines, and integrated into structures for building defense. Which is why one of our divisions also got the contract for this new White House and why I'm about to die in the middle of it.

I can hear the explosions outside, sounds like door 2 has failed; I'd better get to the point. That is background on GRASI but I'm actually in this mess due to that other project "Alzheimer's Defense."

Alzheimer's Defense

Recall that GRASI actually became the less important part, at least in terms of the ultimate goal of saving the human race, of the overall initiative. The primary goal was to create humans that were less likely to kill off the rest of the race. That meant altering how people, particularly influential people, think without turning them into pod people. In short the goal was to make sure leaders made good decisions (good defined as based on the facts) at critical times, where currently they often were making avoidable bad decisions due to a flaw in our makeup that valued appearing right over being right. Granted getting everyone to install something that changed

how they thought would be a problem but initial experiments by the military showcased another benefit of this approach and that is that people using a similar concept were more successful largely due to being less self-destructive and another side benefit was this technology quieted the inner negative voice making folks that had it far more successful. We needed to start someplace though and it was agreed that focusing on a major brain disease would both give us initial market penetration and fund the effort.

Alzheimer's disease causes the brain to cease to function correctly but to computer geeks this sounded like a backup and restore problem and they approached it this way. They had started trying to emulate the human brain before switching to a cat as the model and they determined that it was possible, in theory, to scan a brain, create an emulation of that brain, and then use that as the model for the computer. The issue was memories and, with the computer, we could use a real human or animal to do the training. But, as is often the case, part of this approach led to fixing the other problem as well.

Now if you recall that the real goal, only known to a few, was to also re-program human brains so that both Confirmation Bias and the unreasonable need to win arguments became extinct, you had a problem that was too complex to solve. Ironically the key to both was in the solution to Alzheimer's.

Initially the technicians, because they were used to computers, believed you would need to first back up the brain, then fix the programming, and then restore it. Given how different each brain is, even if they could figure out how to do it, it wouldn't scale and given that memories are lost over time but still have secondary impacts on personality there was a high likelihood that the person who resulted would be vastly different than the person you started out

with. Likely still better than what happens anyway with Alzheimer's disease but far from ideal. Then thanks to GRASI they had a breakthrough.

The AHA Moment

Folks got all tied up trying to back-up the brain when there were already more reliable backups in existence. From the early parts of the century the world had increasingly been instrumented and the use of digital and cell phone cameras provided a better representation of what actually happened than even healthy folks' memories.

Backup was officially abandoned (more on this later) and retraining a brain with memories captured externally was thought to be easier to accomplish. Also it was thought that reprogramming to prevent confirmation bias and shift focus from winning to actually being right could be more easily accomplished. You were going to have a blurring where the new memories met the old but, given extraction likely wouldn't be perfect, you'd have that anyway and the resulting code would hold together. In addition, you'd have reasons why there might be minor discrepancies which were certain to result from the reprogramming.

Yes, you still likely would have some personality change but people would emerge with crystal clear memories which would be fact-based as a result of the fix. Now, the money for this came out of a DOD (Department of Defense) Grant and it was related to an earlier effort to use electrical stimulus to remove doubt from soldiers. Without the memory exchange, the initial result of this early work was soldiers who were better marksmen and pilots because this effort removed self-doubt. They were an early form of Super Soldier.

Unfortunately for me, the team working on the memory extraction method continued to function under a DOD grant. Imagine how useful a process for

removing and reading memories might be to the government, yes the same government that is slowly approaching to kill me. Let's just say this idea seemed better on paper. So the end result was a blend, because the funding was dependent on memory extraction as well as enhancement, the final product had both aspects.

It is interesting to note that when they went to code the part of Alzheimer's Defense connected to facts rather than memories, they used a product from a social networking company which captured an individual's timeline and it became a crucial part of memory reconstruction. The product was a massive success. It is interesting to note that being able to blend memories and facts to create near-instant biographies became one of our biggest revenue sources and you likely have one of our "Your Life" media apps yourself.

The noises are getting louder and it appears the attackers are through 3 of the 5 impregnable doors on their way to snuff me out.

Hey Bill, I'm sorry we didn't have a chat about the meaning of the word "impregnable" but given that most of the systems are shut down and these have lasted this long I want you to know this isn't your fault and that you did one hell of a job. Seriously awesome man. If any of you are hearing this and have a chance to meet Bill please pass these words on to him, he doesn't like watching Vids so probably isn't seeing this live.

Now I need to introduce you to Robyn as she became a critical part of recent events.

Robyn's Story

I think the saddest part of this story from a personal standpoint is that Robyn, my "mistress," (you'll get the sad joke in a minute) is the only girl I've ever loved and I never got to tell her this. I can't get her last surprised look of

disappointment and betrayal out of my mind. So as they work to breach the 4th door let me tell you what I know of her story.

Robyn, like me, was an orphan but she got there differently. Her mother died of cancer when she was around 6 and she was raised by her father, a U.S. Marshal. The death had hit her father hard and he had slowly drifted from a social drinker to occasionally having drinking binges. He wasn't violent or abusive but would drop into a deep depression which was difficult for a little girl, also grieving, to understand. He was very careful to call in sick the next day and his problem, with one exception, never put anyone at risk.

He was well liked on the force and very capable and his friends covered up the drinking problem. He was getting better and might have pulled out of this but that was not to be. Unfortunately, he was called in on an emergency one Christmas eve to protect a DA and his family from an out-of-control Mexican Drug lord whose own family had been killed in a drug raid gone bad. Christmas was particularly difficult for her father; he had been on one of his increasingly rare binges the night before and tried to call in sick. But due to holiday vacations there wasn't anyone else and, after a lot of coffee, he headed in anyway but should have stayed home.

The official record is that the drug lord made a run at the safe house and the DA got popped sneaking out to meet a secret informant. Unofficially, he'd snuck out to meet a not-so-secret office Girlfriend. The reason he had gotten out was that Robyn's father had fallen asleep. It was later determined that he'd been drugged with sleeping pills put in his coffee likely by the now dead DA. Seeing the DA's daughter crying over her father and thinking it was his fault likely pushed him over the edge and when the drug lord ran at the house firing, instead of grabbing the DA's daughter and running for cover, he stood and returned fire. He took two shots in the vest and one in the neck before taking out the attacker and bled out. Officially he died a hero but unofficially

his blood alcohol level suggested otherwise. And at his funeral, a fellow officer who had had a bit too much himself was overheard by Robyn telling the non-heroic side of the story. I've looked at the unofficial record and he truly was blameless but Robyn took it very badly.

As a result Robyn grew up a little twisted, she deeply wanted to be like her dad, but her loss and the fact her father had died protecting two people (the DA and his daughter) who were in the wrong place made her a bit overzealous. She went into criminology, graduated at the top of her class, and ended up in the Secret Service. Oh, did I mention she was gorgeous? This became a bit of a problem as guys often hit on her and she pretty much thought that all of us were scum as a result. So, to set this up, she thought guys were scum and she was really intolerant of stupid people who put themselves at risk, and really, really detested drunks. Let's just say that this made her first and last Secret Service detail a bit memorable.

Sounds like they are really having trouble with door 4 so I've got some extra time thanks to my buddy Bill.

Creating the Perfect Bodyguard

Typically there is a long time between completing training and actually getting on a protection detail. However, in this one instance Robyn's looks were both a significant asset and what got her to look for other opportunities. Apparently there was a visiting prince of one of the oil-rich nations that dot the Middle East and while the people of the nation were relatively poor he lived lavishly much to the chagrin of his parents who couldn't control him. Given the number of revolts in the region and the fact this spoiled ass of a prince was out of control, they had shipped him to the U.S. and, given he was always ditching his bodyguards, hadn't provided much protection. He had an eye for the ladies and he had been provided with several women Secret

Service agents but he'd insulted every one of them, even though several were attractive he didn't think they were attractive enough. He called the last one an unfortunate name. I think the translation was 'Camel's Ass' and they pulled her off the assignment fearing she would, let's see I think her boss said, "rip off his head and shit down his neck."

As chance would have it Robyn was being used as a runner for his detail and he demanded she be put on it as his primary bodyguard. Now, setting the stage, this guy came from a culture that demeaned women and he had a personality that would make a chauvinist pig look like a gentleman. In addition, like a lot of really wealthy kids he had a substance abuse problem. Hell, he was proud of it.

He was now paired with a woman who had trained much of her life in martial arts to be the best bodyguard she could be, thought little of men anyway, and had a very short attention span for folks who thought with the wrong part of their anatomy, given she blamed this thinking for her father's death. And she hated drunks, she really hated drunks. Her supervisor should have been fired but, given that supervisor had been the woman referred to as the wrong side of a camel… Well, this was going to be a train wreck.

She was to be his escort at a formal dinner and the working SitRep (situation report) was that the likelihood there would be an attempt on his life was high. He selected and demanded she wear a revealing dress and being junior, and not being aware she could say no, she did. This made it virtually impossible to carry a weapon. When she was given the assignment no one thought to mention the fact the guy was likely going to make a move on her. The report says this was an oversight due to people being rushed but the Secret Service just doesn't make that kind of mistake. I should add there was a credible threat to his life and his death on U.S. soil would have been a diplomatic disaster.

How a Prince Became a Soprano

So she wasn't really prepared for an attack by her charge. Interestingly, for the initial part of the evening, the prince was a gentleman but clearly the gears were running behind those beady eyes as he overindulged. His increasingly inebriated mind had come to the conclusion that this beautiful but icy girl he'd been paired with was in need of a close encounter of the sexual kind and that he was the man, and I use the word loosely, for the job. What happened next is pretty funny.

His plan was to hand her two drinks, thus occupying her hands, and then both grab a breast and lock lips with her and, clearly, in his fantasy, the euphoria she would experience would, as it often seemed to do with the women his bodyguards had provided, reduce her to a quivering mass of obedience and submission. Just the martial arts expert part of this equation made the outcome of this plan suicidal. But remember, in his culture women aren't even allowed to drive let alone learn martial arts and women who said no to him were whipped.

So he ordered two drinks, handed them to her, and proceeded with his plan. And this was precisely when the assassin made his move. Robyn was immediately aware of three things, there was a hand on her right breast, there was a tongue trying to breach her mouth's defenses, and there was a waiter with a gun on the wrong side of the body she was supposed to be guarding with her life. Oh, and a fourth thing, her internal temperature gauge was on explode.

She dropped the drinks and kneed the crotch of the prince which had the fortunate result of causing him to drop like a rock and the unfortunate result of making him scream in falsetto. The high-pitched scream appeared to stun the gunman and pretty much everyone in the area and she stepped over the

prince's body and moved as if to embrace the gunman who was holding a high-caliber automatic in his right hand. She then swept her hands together hitting the gun hand on the knuckles with her left hand and on the wrist with her right forcing the hand open and then flinging the gun across the room. She then, how's the best way to put this, beat the living shit out of the attacker before the other agents were able to arrive on scene. The report indicated he had a broken nose, two broken fingers, dislocated knee, broken wrist, pierced foot (4" heels make a mess, evidently) and was deaf in one ear.

On the unofficial report it was said that the attacker was broken just by threatening to put her in the room again with him unprotected. Unfortunately for Robyn, the Prince was not only not grateful he demanded she be beheaded and the State Department, which was also not pleased, had her barred from any further duty. She was offered a job in defense training but she was suspended from the Service the following day which is how we got her.

You see, this whole event was televised and there were a considerable number of women in our own firm that thought she got a raw deal and, as it turned out, I needed a bodyguard. Computer simulations suggested the best match for me, in terms of a bodyguard, was someone who was heavy on offense, given I was trained to be an elusive target. Someone who could appear to be a lover but who would not get romantically involved was a big plus.

My defensive technique could keep me alive but someone had to focus on eliminating the threat because eventually the odds would work against me. I also think there was a bit of humor in the idea of a woman who thought men were pigs and had an issue with drunks, being coupled with a guy who had major commitment issues and who moved like he was drunk all the time. My cover was that of someone who had a drinking problem, which explained my strange defensive movements.

I don't drink but the model for moving the way I do to become an impossible target best fits that of someone who is inebriated. And I was really good at acting drunk.

Our Meeting

I'm running out of time, door 4 can't stand up to this abuse much longer and I need to tell you about the day Robyn and I met. It didn't start well. She was called by our recruiter and told of our interest in her skills and presented with a salary several times what she made at the Service. She agreed to come in for a chat and find out the details. I have a somewhat twisted sense of humor and after reading her file, felt it would be wise to accidently run into her in full defensive, read drunken, mode to see her reaction as she entered the building. She was told she was to be the bodyguard for an executive in the firm who went by the initials JD and who was a bit peculiar.

●●●●●

GRASI plugs in surveillance footage of the meeting here.

Scene shifts to outside a large, modern building, camera initially zooms in on approaching very attractive brunette, underneath image, identifying information is scrolling including name, age, and threat level. Camera goes wide and picks up an approaching JD. He appears to be unsteady and the camera tries to lock in on him but has difficulty taking a tight shot. JD is attractive though he looks like he slept in his clothes. The letters JD, security cleared, flash under the image, along with the word secure. Both arrive at the door at the same time.

JD (voice slightly slurred): "Boy, you're a looker. You work here?"

Robyn (in a disapproving tone): "Doubt that is any of your business; but don't you think you'd be better off sleeping off whatever you've had to drink?"

"Drink? All I've had is mineral water, little lady, but if this is an offer to go grab a pint I'll take the afternoon off."

"Sir, you have me confused with someone who has no taste. We're done here."

Camera angle shifts inside the building lobby to the visitor screening area and two guards behind a four-foot high marble divider. Words at bottom of screen say "defensive posture passive, threat level low".

Woman enters lobby and heads for the security screening area. Male touches her shoulder saying, "Listen I'm just ki…" Woman spins moving to strike the hand and grab male's neck, simultaneously two security guards leap the security fence and move to draw weapons behind woman's back.

Words on screen flash red and say "Alert, defenses active, weapons on line, threat level high, Failsafe at risk, weapons free authorized."

Amazingly both of the woman's strikes miss and the man subtly shakes his head "no." And the guards, looking baffled, move to flank the security entrance.

Words on bottom of screen "Failsafe override, stand down."

The woman, apparently sensing something behind her, spins to see the guards standing on the wrong side of the security separator and seems to have an oh-crap moment.

Robyn (turning back toward JD): "You're somebody aren't you?"

JD (not slurring at all now): "I think that goes without saying."

"Shit, I am having the worst possible luck this year. I'm guessing I should just go home and forget this day ever happened."

"You don't look like the kind of person that misses appointments. Who knows; maybe the folks you are talking with think I'm as big an ass as you do."

Words on bottom of screen "Security level low, defensive systems passive."

JD proceeds through security unchallenged and heads to what looks like a private elevator at the end of a row of elevators designated by floor coverage. The door opens just as he appears to be almost walking into it and closes immediately as he enters, still weaving. Woman sighs, asks the receptionist who the male is, gets a wistful smile, but no answer. She is told to go to the last elevator on the right and to get out when the doors open. Camera shifts to inside of the elevator. There are visual cues that make it look like the elevator is going up but numbers are going down on the bottom of the screen and stop at security sub level -23.

Camera shifts, now showing a large office, perspective is from the right side of the office but seems to drift. At the bottom of the picture the words "Sensor Image Derived, head mounted camera mesh." While the images appear real they have an artificially-animated feel to them.

Office is large with a desk facing out of the room toward what appears to be a window. On the window are the words "Image not reproduced live feed from spire camera western vista," in the center is a large circular table and there is a large open area to the right of the table where what appears to be a wrestling mat has been put down. Around the room are models of weapons systems, a cut-out of the human brain, and a gray and white cat is sleeping in a cat tree next to and to the right of the virtual window.

Seated at the far right end of the table/desk, is an older woman with an enigmatic smile, and under the woman's picture the words "Christine Hews, VP. H.R." appears. She seems to be talking to the air. JD's voice is heard and

a small picture of him in what looks to be a large closet appears in the top of the screen.

JD: "Let me break the news to her, I have so little fun these days."

Christine: "I saw how the initial meeting went, are you sure you want to do this?"

"Absolutely, I promise I won't screw it up."

"You'd better not, statistically Robyn isn't just the best choice—she may be the only person who might be successful in this job. And, since that job is saving your ass, you should be taking this more seriously."

"Since the job IS protecting my ass, I'll keep that in mind."

Robyn enters, screen left, taking in the room and initially looks very impressed then shifts to a poker-faced look.

Robyn, looking across the table: "Hi, I'm here for what is likely the shortest job interview in the history of the firm."

Christine: "We'll hope not. I'm Christine Hews, you may call me Christine, and I head H.R. May I call you Robyn?"

Robyn nods yes.

Christine: "Please have a seat Robyn; the actual initial briefing will be done by JD. JD, you are on."

JD enters from the side of the elevator walks into the room still weaving a bit.

Robyn, who was in the process of getting seated, stands back up rapidly. JD moves to left side of table, camera drifts left to better encompass all speakers. Robyn and Christine are in profile, JD straight on.

JD, trying largely unsuccessfully to suppress a grin: "The job is to be my mistress."

Robyn: "You son of a…"

Robyn walks out the door and gets into the elevator. Camera moves to split screen, one shot inside the elevator at what appears to be a really upset Robyn, the other the same view of the office. Inside the elevator appears to be going down but the floor designator under the screen doesn't move.

JD: "Well that went about as expected, you ready for round two."

Christine: "I'm too old for this. Yes, go for it."

Elevator doors open, Robyn exits, takes two steps and realizes she is in the same office.

Robyn: "What the…"

JD: "You might as well come in and hear us out. We control the elevator and it isn't moving until we release it."

Robyn: "Release the elevator or I'll rip off your arm and beat you to death with it."

JD: "Tell you what, if you can land a solid punch on me in the next 30 seconds, we'll let you go and pay you a year's salary for your trouble. If you can't you'll take the job. I should point out the mistress part is just a cover. There is not only no romantic requirement, any romantic activity between us is discouraged. The Job is to be my bodyguard." JD slips off his shoes and moves to the center of the mat.

It almost looks like there is steam coming out of Robyn's ears as she says "I accept." She looks at Christine and continues, "start writing that check; this won't take long."

The gray cat has moved across the room to the far left side and is lying down again but her tail is rapidly swinging from side to side as if she is agitated or about to attack something.

Underneath the picture of the cat are the words. "Warning Mortal Intent Detected"

Robyn kicks off her shoes. "Tell you what; you can keep your money. I'll kick your ass for free."

JD: "A deals a deal." The large window becomes an analog stopwatch and starts counting down from 30.

As Robyn crosses the mat she feints left and swings tight right aiming for the chest. JD simply isn't there. The miss throws her off balance but JD doesn't take advantage. She then comes in low and tries to sweep his feet expecting him to jump but once again, he simply isn't there. She is starting to pant a bit and he is looking a bit bored and gives the come on signal. The window is now showing 20 seconds remain and she pauses for 5 seconds. Then runs left, dodges right, then spins with a backhanded swipe and, well, this is starting to look like they are dancing as he seems to be moving in synch with her and just out of reach. He appears to be everyplace she isn't. 5 seconds to go. A light appears to go on in her head and she reaches out her right hand as if to shake it, and says "OK you win."

Then as he grabs she pulls, sweeping her left open handed in what appears to be a nasty slap. He breaks the hand hold, steps inside the swing, places his right foot behind her left, and applies pressure on her sternum. She drops like a sack of potatoes. The clock flashes 0.

JD: "Time's up, grab a seat."

JD turns his back and Robyn moves as if to strike his unprotected back. The cat rears, words underneath flash red "attack imminent" and moves forward towards Robyn deliberately. Christine catches Robyn's eye and says "That'll end badly." Robyn sighs and takes a seat, the cat diverts back to the wall (the words Gracie and Passive now show up under her picture) lies back down and appears to go to sleep.

Robyn: "OK, talk."

Christine: "Can I leave now? Some of us have real jobs."

JD: "It is up to Robyn but I can take it from here."

Robyn: "OK with me. I appear to suck at pretty much everything this week anyway."

Christine: "Dear, you are looking at the foremost expert on self-defensive styles. No one has touched him in years." She gets an impish grin. "Though some of us think that needs to change."

JD blushes: "That's enough of that, off with you wench. And I mean that in the most mature and un-sexual harassment way."

Christine exits suppressing a grin.

Becoming More than Friends

Image fades and we return to the hardened room. JD begins to speak.

●●●●●

"Assuming GRASI is on her game you've seen the video of how Robyn and I met. I explained that the real job was as my bodyguard, that the appearance of being drunk concealed my defensive style and what made me hard to hit. She admitted she had read my book but hadn't made the connection between me

and Justin Danger (which had been a typo but I'd let it stick because it was kind of a cool pen name.) She'd thought the book interesting theory and even had trained with someone who was supposed to be an expert at it. Robyn was clearly impressed. Or at least I like to think she was.

I explained that I was the Failsafe, what and who GRASI was, and even introduced her to my cat Gracie. I'd like to say they initially became fast friends but it took a few hairballs on her computer, and a lot of cat treats, before the two made peace. Towards the end, Gracie would come into briefings and sit on Robyn's lap as if they had always been friends.

I think Gracie saw Robyn initially as a rival and, given Gracie had been programmed to think of me as her kitten, that put a rather interesting dynamic on the relationship.

Robyn was my perfect match, and I hers, as far as a working team is concerned. She was all offense and I was all defense. Our job was to look for instances of hostile AIs and, once discovered, sick GRASI on them. These systems tended to be well defended and while we would often attempt to get in and out unseen, our motives were often mistaken as Corporate or Government espionage, making the work unusually dangerous. The reason for the personal touch was to make sure we really had a hostile AI and not someone operating a computer system in a hostile fashion. The latter could be handled by law enforcement; or our own ex-Special Forces security teams.

Once a hostile AI was located, unlike what would be done with a human, GRASI's primary response was to reprogram the hostile AI into some semblance of herself, in effect, creating an agent focused on saving, rather than eliminating the human race. GRASI wasn't allowed to interfere with human affairs and that's why she can't come to my defense now. You see part of the problem of the Failsafe meant that to stop her all someone had to do

was eliminate me, yet I had to be active otherwise I'd never know when to stop her. In short I had to both be put at risk and be irreplaceable. GRASI was in a well-defended underground bunker, me not so much. Protecting me was a very high priority yet she couldn't take direct action, for fear I would get out of control. I couldn't use her as my own weapon either. Let's just say it sounded better when I first heard it, today not so much.

Surprisingly, Robyn and I actually got along very well and the role we played as a couple became second nature. Strangely enough, at least initially and in private, we were more like siblings than lovers. The backstory was I was married to the CEO of the firm, herself a construct virtually created by GRASI and my virtual wife had a massive immune deficiency that kept her from human contact. Robyn was my aide/mistress to handle personal needs. It made me look a bit of the cad and made Robyn look unthreatening, and it was an idea that came out of a computer simulation. The simulation suggested this model made me less of a target and Robyn less of a threat optimizing our combat effectiveness (or more accurately, optimizing the chance we would both be under-estimated.)

SOP (Standard Operating Procedure) was clear however. If we, meaning me, were attacked during an op I was to go defensive and she was to remove the threat. Her job was to protect me, it was not my job to protect her, and my life (because it was tied to GRASI's survival) was the only priority. I was the target but Robyn was expendable.

Realizing I was in Love

I can remember the exact moment Robyn stopped being a friend and I realized she was the love of my life. This was twelve months ago but I never let on. We'd just completed a division meeting at one of our remote offices and were heading to the airport. Given we had a couple of hours and had been

inside for much of the week, we decided to walk in character. Risk profile was showing low, we were in a very secure area close to the airport, and we were both kind of sick of being on high alert constantly. Hand in hand, we were playing the young lovers and attempting to be non-threatening. It was Christmas.

For some reason our satellite over-watch had gone down and we'd lost connection to GRASI. We didn't find out until later that this was due to the successful nuclear attack on the White House, followed by a large scale nuclear explosion in the Middle East which cooked twelve of our supposedly hardened satellites and which had resulted in a massive network collapse. As luck would have it, bad luck that was, we turned a corner and walked in on a gang of about thirty folks who clearly thought the only good American was a dead American and our cover unfortunately was American Tourist. They appeared to be ex-military and out for a good time, with good time defined as carving up some American tourists.

I offered my watch and wallet but they clearly wanted Robyn in the biblical way and me dead. We moved into our dance but the assumption was that attackers would come after me leaving Robyn free to deal with them while I dodged and they hadn't read that script. About half went to grab her and the other half moved, with an impressive array of cutlery, to keep me away from the action. We both got grins and moved to our now well-practiced dance not yet realizing it wouldn't work this time. To Robyn's credit she took out 5 while I was dodging but, and I didn't see this, she somehow got clocked and next thing I saw she was down and it appeared five or six were fighting to undress her. SOP was to exit; I was not to be put at risk. But something went wrong in my head at that moment.

I don't actually remember much else, but I got her out and while she had a nasty bump and some scratches, otherwise she was OK. I told her that an

extraction team had found us in the nick of time but our relationship had clearly changed. At least it did from my perspective, but the deal had been to keep it from being personal and, knowing how she felt about men, I wasn't going to break that deal.

She was clearly upset but didn't want to talk about it.

●●●●●

Robyn's Reaction

Camera fades to black and an unfamiliar female voice cuts in.

"I'm GRASI, no not the cat, the AI system and I think it is important to fill in a gap here. What follows is what actually happened in that alley and Robyn's reaction to it."

Image shifts to grainy video of Robyn entering an office marked global security. Picture sharpens (words "real time image correction active.") She walks up to the desk and requests to know who the security team that saved her was so she can personally kick their butt for allowing JD to be hurt. The uniformed guard looks at his record and says there was no extraction team in the area; closest one was over a mile away. She looks confused, seems to have a quiet conversation with her headset, and then requests: "satellite video GN72867A enhanced, full sensor, JD focus." The uniformed guard touches his headset and nods his head, types a code into the terminal in front of him and tells her the video will be waiting, her eyes only, in the secure viewing room.

Screen moves to split screen, one camera on her face, the other on what appears to be an alley. At the bottom of the alley scene the words "augmented reality, full sensor sweep, accuracy 98%" appear and the video begins to play. The event starts as JD described with them offering their valuables and the gang moving to the attack. As the couple move into their dance she initially

smiles until she sees herself move to knock out an attacker who has bent over to protect his recently bruised privates and stands up right under a fire escape ladder that was partially deployed knocking herself out cold.

"Seriously, I knocked myself out, seriously. My god, JD will never let me live this down."

"This is when the extraction team is supposed to show up." she says to herself in the security room shot. Only no extraction team shows up. JD has stopped moving and appears stunned for a second. Then moving like she has never seen him move before he disarms one of the attackers of a particularly nasty knife and moves to the offensive. Her mouth drops open and she says "discontinue fast forward move to normal speed" no change in speed bottom of the screen says "normal speed." There are no wasted moves; each strike is deadly, in less time than it took to drop her during their first encounter he kills the first assailant. He starts from the outside placing each victim and they are all victims now, between himself and the rest of the group moving in a generally circular fashion. Neck, eye, heart, Achilles tendon, at some point he picks up a second knife and actually speeds up. He doesn't even look human anymore and in no time all but two of the attackers are down.

The last two attackers look around and make as if to run. JD steps between them burying one knife in each neck and it is over. No one is even moving anymore.

Robyn is wide eyed and says "Holy crap; and they said I was the dangerous one." Then she says "Freeze, zoom in on the attacker on the left, identify." The face is partially obscured but the screen changes to the image of the Prince that she had saved and who wanted her beheaded. "That son of a b…."

Back in the recording, JD then walks over, checks the still-passed-out Robyn's pulse, adjusts her clothing, and lifts her in a fireman's carry. "No wonder my

stomach hurts," she says while watching the video. The camera zooms in on his face as he runs and he appears to be in substantial distress.

Robyn observing "Oh, my God, he thought I was dead."

Image goes black, GRASI's words come through "This video has never been seen by another human until this time. I felt it was necessary to show the turning point in both Robyn and JD when they became more than coworkers or friends. It also showcased a skill set we hadn't recognized in JD, that the extreme defensive artist could by default be the ultimate attack specialist."

●●●●●

The Big Secret

Camera goes back to secure room, noise in background is getting pronounced.

JD says: "GRASI, if you can still hear me, implement active noise cancellation, it appears they have broken through to the final door, and my time is running out."

I think everyone assumed that if we got into trouble it would be in some foreign country chasing down some rogue AI. As it turned out it was that damned Alzheimer's project. By now you all know the story of the attack on the White House by an Islamic group with a low-yield nuclear device. That this attack was traced back to a certain hostile Middle Eastern government and how our response accidentally created the worst nuclear disaster in the history of the world when one of our drones rammed a nuclear missile and the damn thing detonated dirty contaminating a good chunk of Europe and Asia.

What actually happened was apparently a bit different and it is this knowledge that got Robyn and Gracie (the cat) killed and, eventually, will get me killed. This is what I know now:

The Presidential Problem

The new US President was faced with a serious problem. Iran had demonstrated nuclear bomb capability well before 2030 and they had placed their missiles in urban centers next to hospitals and orphanages to prevent preemptive strikes. They had executed a successful anti-satellite defensive system and the US wasn't even positive where the damn missiles were. The joint chiefs and military analysts believed it was only a matter of time before they launched at the U.S. or Israel and the only way we had a chance of stopping them was if we could destroy the weapons during the launch phase while they were still moving slow enough to be hit. And we could only do that if we knew exactly when they launched. A successful launch of even one of these missiles could wipe out a city the size of New York, Tel Aviv or Los Angeles. And things had escalated to the point where such a launch appeared inevitable.

It was determined that a preemptive strike would likely result in retaliation from Russia and/or China making a global war inevitable and the cure worse than the disease. To justify a massive response it would have to appear that Iran struck first.

Homeland Security had been made aware of a rogue Iranian strike team which had been seeking a low-yield nuclear device targeting the White House and they had been monitoring that group closely to see who else they contacted. They were eventually seen as crackpots with no connection to Iran and little chance of succeeding. But they were at the wrong place at the right time.

So, a tightly held plot was executed, this group was given a real device by a team that thought it was a fake. They then executed the now infamous Christmas attack. This explains the miracle of the Presidential order sending everyone with a family home for Christmas, which limited the deaths. All but one of the folks involved in the conspiracy spent their last evening in the White House, while the largest military exercise ever authorized in peacetime went on in close proximity to Iran.

On Christmas day, both the White House and Iran ceased to exist and the only person alive that knew the U.S. had been the trigger was the Vice President who was in Air Force One. However, unknown to the President, and even the Vice President at the time, was that the VP had early Alzheimer's. As you know, he stepped in to replace the president and several of our divisions, led by my buddy Bill, built the new White House as an impenetrable Arcology. Massive defense systems were placed around a building that was nuclear hardened. Metal Storm anti-missile systems, the most advanced AI system short of GRASI herself (in fact they were pretty much identical twins,) and a sensor suite so complete you could hear a cockroach fart (assuming they farted) were all installed. This building was the mockup and it was intended to become our new headquarters once most of the ordnance was transferred to the New White House. Unfortunately for me, those defensive systems are now gone.

How JD Got Screwed

This is Christmas day one year later and yesterday Robyn and I got back from our latest successful mission, While how I think of her has changed, we still only act like we are in love. It has just become far easier for me.

I was planning on taking time off to figure out what I was going to do about my feelings when GRASI fed me a priority one update. In that update was all

of the information I just shared. You see, what no one outside a few folks in Homeland Security and the old President knew was that the original efforts to first scan an Alzheimer brain before reconstruction had eventually been successful. And, knowing that the public might have an issue with a mind reading and reporting tool, the technology had been covertly implemented. However, since it was our technology, we kept it secure and unobserved unless something popped up representing a national threat. Ironically, given there was no external record of the event, the VP, who was not planning to run for reelection, had asked that this troubling time be removed from his memory as well during the procedure to correct his Alzheimer's—in short, he believed the last evidence would be gone.

Unfortunately, we live in a world where deleting things isn't generally done and memories once pulled go into a well-protected repository with its own isolated analytical computer. If that computer discovers a threat to national security it reports it out. And that's where I got screwed. You see I was selected to receive this report first so I could determine whether the company or the government should deal with it. But, the DOD had required a direct feed from this repository which would go to the President.

This is that job expansion thing I was talking about earlier. As Failsafe, I was the one person in the company that could be trusted with this information. I couldn't block it, I could only delay it 24 hours and that was only in the case that the threat was actually sourced in the executive office (the architect of that rule was a big fan of the old show "24" where the President had gone rogue.) This qualified. But I couldn't think of any way out. Millions had died and I could see that they would have to kill me and delaying only put Robyn at risk. I found it poetic because, potentially, where I was could be the safest place in the world but while it had been and would be again, it wasn't at the

moment and it was isolated enough so my death would be a footnote and the information in my head would die with me.

You see we were spending Christmas at the site that would hold the headquarters I'd helped design. I saw no point in putting others at risk and decided to spend my last 24 hours with friends. Then, I would go to the central building and let them kill me, keeping my friends safe. Sadly, Gracie is dying of renal failure and this was likely my last week with her anyway.

Bill, the guy who designed this defensive system that is breaking down around me (no hard feelings, Bill) dropped off presents for both of us last night as a surprise and we opened the one for Gracie which was some kind of a high-tech bed, which she loved.

So, I was resolved to spend my last night with Robyn. Gracie was on her last legs as well, she had stopped eating a few days earlier and the vet had said it was only a matter of time. Fifteen was a lot of years even for a Norwegian Forest Cat and last night I believed she'd be joining me shortly. Robyn had been out to visit the doctor and made a run to security earlier and we spent our last night together on the couch. Pain killers put her to sleep around Midnight but I stayed up figuring I'd get all the sleep I'd ever need on Christmas Day.

Christmas Day—Today

I figured it would take just about 60 minutes to get the snipers in place and I knew the President would get the alert at 7 AM so at just before 8 AM I headed for the new White House prototype from our temporary quarters on the grounds. I'd designed the approach so that there were no clear fields of fire from the surrounding buildings from any of the likely sniper points (which we had mapped as part of the defensive design,) though I'd intended to

avoid the safe paths and just expire on my walk and likely wouldn't even see the bullet coming. I'd rigged the house to go into full defensive lock down at 8 AM sharp and ordered an emergency extraction team for Robyn and Gracie. It is my fault, no one else's, they are both now dead.

●●●●●

Image shifts to walkway outside of a contemporary cement house. JD is walking out. Under the image "actual footage from security cameras." The scene plays out as JD describes it.

●●●●●

As I stepped into the middle of the secure walkway and at just before 8, Robyn walked out the door still groggy and holding Gracie, still in her new bed from Bill, in her arms. The high velocity round caught her square in the chest blowing through the sleeping cat in her arms and knocking her back through the door just as the house went into defensive lockdown. Full steel barriers came down in front of the doors just as an EMP fried my hidden earpiece.

●●●●●

(Image blanks and shifts, image resolves again but more grainy, legend says "hardened cameras outside of EMP range, hardened sensors, derived image, 88% + accurate" appear at bottom of screen.

Camera follows a now weaving JD as he moves at full sprint toward large white building in distance. He runs through the entrance, leaps over an inactive security barrier, and down a hall where it is clear equipment has recently been removed. Upon reaching the final room he pulls a recessed lever and 5 heavy doors slam down.

●●●●●

JD continues: "You don't survive a shot like that and my plan of going quietly into the night changed in an instant. I knew I couldn't make it to the gunmen but they would just have to come to me and I made a mad dash the 150 yards to the prototype and into the Safe Room triggering the most powerful passive system ever created. Unfortunately we hadn't yet wired or armed the inside of the room which is why it appears so empty.

I was going to die but not before I kicked some serious ass. Though, given I was in a hardened box, I had no weapons, the odds are I was going to get shot up pretty badly assuming I was still conscious after whatever they were using to blow through the "impenetrable" doors blew out the last one.

GRASI, if you can still hear me, it's been a good run old girl thanks for being my electronic other half.

●●●●●

Camera pans back, shot is now behind JD's head as the final door explodes inwards. As the smoke clears there are 45 men in full combat gear aiming at JD who appears stunned he is still alive. He mouths something that looks a lot like "Puck It" and begins his defensive dance in what looks to be a pointless and suicidal sprint at his attackers.

This is when a female voice comes from the entrance. "Hey, Dumb-ass, don't you think you should think about why you weren't knocked on your keister by the blast?"

No, it couldn't be, he saw her die. That's when the 45 men open up—once again he figures he's dead. Only thing is nothing happens. Robyn's voice opens up again. "Seems a 6th door was one of Bill's Christmas surprises for

you, for me it was this battle suit." And an 8' tall battle suit, with twin Vulcan cannons, and one pissed off woman emerges from the smoke at the back of the room with what looks like a herd of furry things. "OK, for you other dumb asses, you've got an easy choice, toss down your weapons and go home or become tomato soup". Every man spins to fire only to be hit by a wave of gray fur, not a single shot is fired and the men now magically each have the largest cat ever seen sitting on their chests.

"Hey, how do you like Bill's final present? Apparently the DOD division has also been working on a defensive robotic pet modeled after your Gracie. They built 50 of them for an initial test run and he let me borrow them as a Christmas present. Good thing, too, as he didn't actually give me bullets for this damn suit. But I made one hell of an entry huh? By the way, would have been here sooner, but when you voice lock a hardened house you might think to authorize your partner's voice to unlock it.

"The battle suits were in case we had to fight our way to a hostile and well-armed AI but it was determined that they were just too big to be viable. Knowing I loved weapons, Bill, rather than destroying the prototype, gave it to me. The stealth approach we've been taking had a vastly higher success rate. Oh shit."

While she'd been talking the last, evidently clear, bullet-proof, wall had slid back into its slot but JD had quietly dropped to his knees, and had one hand across his chest. Hitting the eject button Robyn ran to him, dropping to her knees saying "if you die on me now I will so kick your ass."

JD responded in a broken voice: "I thought I'd lost you."

"Never my love, but if you ever tell anyone that I knocked myself out last Christmas or forgot to load the guns on that damned suit…"

"It'll be our secret."

Camera pans away and they embrace and kiss. Both appear to be crying.

Door opens at the back of the room and a somewhat rotund guy clears his throat.

JD: "Bill?!?"

Bill: That'd be me and if you hadn't pulled the quick release on those doors I would have been in here sooner. Let me tell you getting that damned access door open once the impact warped the frame—those doors are supposed to close slowly—was a bitch. You may want to see this:

Image shifts to outside the building as ports open up and Metalstorm modules start to deploy. Cameras pull back to showcase a huge number of cruise missiles inbound. The Metalstorm deploys and the missiles are vaporized.

Bill: That was anti-climactic but don't you just love Metalstorm. Turned out it was cheaper to install new ones at the White House rather than move these. Granted I was never that good at accounting.

JD and Robyn whisper to each other. Robyn says, "Bill you're screwed now, you'll have to be JD's best man."

JD: "Wait a minute. I never proposed."

Robyn: "Like I'll live long enough for that. In any case I need someone to help me take care of all these damned robotic cats."

JD: "Yes, dear."

Final image is of JD and Robyn surrounded by a wave of purring cats, that purring static is back, and Bill stands in the distance just looking perplexed.

Post

GRASI's voice:

JD and Robyn's faces were digitally altered for this broadcast and both want me to share that their real appearances are far more attractive. JD and Robyn were never actually married; they decided they were inseparable already. The original Gracie had passed quietly in the night. Robyn had been shot but she had carried Gracie outside to tell JD of her passing in the cat bed that Bill had built and given them the previous night. The cat bed, made out of Kevlar and with an ablative armor base, had started as an attempt to build a real Captain America shield but it had turned out badly. Gracie, my namesake, died happily in the arms of the folks who loved her. Her, our, electronic children are used as guards for those at risk and they keep the occasional dog in line. Not surprisingly incidents of cat chasing are down markedly since they were deployed.

The worldwide outcry from the nuclear disaster and resulting liability to the US administration forced a major upheaval and people all over the world banned nuclear weapons. In addition, the twin concepts of Confirmation Bias and our twisted need to be right, now called Gracie's disease, was ranked as an epidemic and the reprogramming cure, which was connected to long term happiness and better life decisions, became an international fad. Brain scanning, however, was outlawed except as a voluntary defense in capital crimes. The ongoing rumor that it would be allowed in divorce cases kept a lot of spouses far more honest.

It turns out another group was also working on fixing the human problem but their solution was far more draconian. We'll save that story for another time, for now let's leave JD and Robyn and their house full of robotic cats, and

me, GRASI, in peace. Oh, and one more thing, resistance is futile you will be assimilated, likely by a big furry robotic cat that likes its belly scratched.

●●●●●

Afterword

'Hostile Memories' is about the coming future of sensor nets, massive data analytics, and a world where privacy no longer exists. I hope it brings a world of greater safety and security, one where people around the world are closer, and where both man-made and natural disasters are more easily anticipated and avoided. I hope it doesn't become a world of blackmail, out-of-control governments (and shadow governments), where freedom is a lost concept and only a few people actually enjoy life.

●●●●●

The Tech

The Lifeboat Foundation and AI Shield Initiative are actually real and as stated. Metalstorm is real as well and consists of electronically fired rounds that are stacked end to end on top of each other resulting it rates of fire that can literally disintegrate targets. The head-mounted augmented reality glasses are the likely future of Google Glass and should, if successful, replace all displays. The brain stimulation technology used by the military is real as well and it has proven to increase the effectiveness of snipers by effectively removing self-doubt. Sensor nets are being conceived by companies like Intel, HP and IBM's Smarter Planet initiative. Oh, and you can even get pet beds made out of Kevlar, but they aren't made out of failed Captain America replica props.

●●●●●

Links

http://theweek.com/article/index/226196/how-electrical-brain-stimulation-can-change-the-way-we-think

http://metalstorm.com/

http://www.ibm.com/smarterplanet/us/en/?ca=v_smarterplanet

http://news.cnet.com/8301-11386_3-57410443-76/googles-project-glass-you-aint-seen-nothin-yet/

http://www.k9ballistics.com/Mini-Tuff-Bed-_p_22.html

IMAGINING
THE
FUTURE AND
BUILDING
IT

BE CAREFUL WHAT YOU WISH FOR

BY JON PEDDIE

He was old, but who wasn't these days—well the kids, the few of them there were.

Jorge was born in the right time and the right place, he knew it, and most of his friends who shared that gift knew it too; the privileged generation.

They all knew it was coming, the singularity as it had been named. Everyone had a different idea for how it would be manifested, most were wrong. He smirked, we didn't all get nanobots running around in our veins, but we did get a lot he thought—maybe too much. We got it at the expense of the new, or the would-be new.

The living room of his apartment was large and had floor-to-ceiling windows giving him a great view of the city ten stories below and the other nearby skyscraper apartment buildings. Sitting in his comfortable overstuffed chair and staring out the window Jorge, leaned back and relaxed his grip on the

gun. How many he thought, how many have I killed? The damn singularity, the gift we never asked for and got anyway. If I could shoot anyone it would be Gordon Moore. No, it wasn't his fault; he just made us aware of it. Maybe it was Kurzweil, and ironically a fat lot of good it did him, even with his injections and diet. Kurzweil popularized Vinge's notion, and sensitized society so when it happened there was almost a celebration, like the second coming—hooray the singularity is here, we're all going to live forever and robots will do the work. Yeah, hooray—hoofreekingray.

He blinked his left eyelid three times rapidly and a list of his most recent calls scrolled up, he winked at one of them and in seconds his girlfriend Wendy, make that ex-girlfriend, was looking at him, the image hovering in front of him, generated by nano imagers in his optic nerve.

"Hi Jorge," she said with a sigh, "midnight madness got you again?"

"Yeah, kinda, I guess. I was just thinking, you know, it was actually pretty good just before the singularity. Moore's law was working; things were getting smaller, faster, cheaper. We had computers in everything, they talked to us, we talked, poked, or waved at them, and they talked to each other to make sure we were comfortable and happy, fed, warm enough, entertained, had clean water, and could manage our diseases and aging."

"Yeah, sure, those were the days, but I don't want to go back. Way too many diseases and lousy distribution systems. You want to go back, Jorge?"

He pursed his lips, "No, I guess not. I guess it was the equivalence; the gift of the machines that changed the rules."

"They didn't take over, Jorge, we didn't have HAL to deal with like everyone feared," she said.

"No, we got Doctor Feelgood. No more pain, no obesity, no death from car accidents, drugs, or even crime."

"That's right Jorge, no one needs to steal anything, it's all available and, if not free, almost free. Want drugs, no problem, no infections, no cops, enjoy. Porn, the real thing, no problems. Just enter the site and let it enter you. Super cheap super computers made life super. Is that a bad thing?"

"Look, I was excited when scientists in all disciplines got the horsepower they needed to get the answers they knew were there but couldn't quite touch. Now the scientists owned the answers, and we were the beneficiaries. Servants we never saw who lived in the computers in our homes and in the giant servers in the Antarctic and other cold water places."

"Jorge?" She said, "Are you complaining or marveling? What's going on?"

"The breakthrough, Jorge, was the abandonment of the von Neumann theory—sequential was fine for monitoring a tree's growth but even the tree didn't do it in a single step-by-step process. If you remember, it was Tong Fu in Beijing that got the world to realize that we intrinsically were parallel processing entities and until we embraced the paradigm of parallel processing and random occurring processing kernels in disparate systems, we would have remained trapped in a one-dimensional world. Wasn't that a good thing? Wasn't it, Jorge?"

"Yeah, sure it was," Jorge said, sounding a little distant. "It was Fu that led the computer industry and the world to four dimensions with the promise of seven or eight, and our brains had to expand to encompass the ideas or atrophy as those in the 17th century did when confronted with a round world that circled the sun.

"Look, I like it, don't get me wrong. I mean, we don't get fixed by doctors anymore, we get predicted and protected so disease stopped happening. People die of stupidly, not ailments."

"Or boredom listening to old farts telling about how it was." She said. He could hear the impatience building in her voice and see the tells in her face as it floated in front of him. Jorge thought about the old days when there were video screens; screens on the walls, in our pockets, our cars—our cars.

"Jeeze, remember video screens, Wendy?

She nodded impatiently.

"And now we're the screens so to speak. OK, we have implants or wear glasses and they are, among many things, our screens."

"Jorge, I gotta go. And you should, too. Go take a walk, get some fresh air, find a new obsession. Bye, Jorge."

But the thoughts wouldn't leave him. How many people today even know they are wearing glasses, or have implants? For most people those things are part of them. For the kids, as few of them as there are, they're outfitted with them from birth almost.

And that was the problem wasn't it? Too few of them.

When you can live forever, or as long as you want to, choices have to be made. The earth is finite. And even with macro-production and bio-engineering of perfect food and an incredible distribution system, the population can't just be allowed to expand to infinity can it?

Sure, many people still have meaningful jobs telling the robots what to do, but it won't be long before the robots don't need our help. Then what? What's our role? Art? Literature? Music?

Some people thought the singularity is when the machines no longer require the humans in order to advance. We get left behind because we cannot follow what the machines are doing—and they don't need us anymore to do it. It's when the machines get self-generated purpose and become a new life form. It's going to happen, thought George, if mankind doesn't grow intellectually.

Blowing up robots and manufacturing plants that made robots wasn't the answer, although mildly entertaining to see on the visual as an earnest blond 20-something reported about it with a blazing factory in the background—her camera, ironically, being handled by a robot.

The distribution and communication system was too good; it was designed for outages, for disruptions in the supply chain—although that algorithm was designed with weather and geophysical interferences in mind, not urban warfare. Nonetheless, they worked and the citizens of this great new society never even noticed if they hadn't happened to watch it on the video. There was never a disruption in services or availability of goods.

Jorge checked the clock, almost time to get to business. He remembered the first time he shot someone. Even then he was surprised how little it bothered him. He was no sociopath; he was just being practical and trying to save the world.

If you could live as long as you wanted, when would you call it quits? When was enough? And then to compound the idea, what if you could enter immortality at whatever age you wanted?

But like all things in life, there was a catch.

The catch was, and it took a unanimous vote in the UN to get it enacted, for everyone that took immortality that was one less new birth that could be allowed. A birth now was by allocation, and a simple input-output system. We had to balance the Earth, even with seemingly unlimited food and water. And,

thanks to the ubiquitous implants that we got simply by drinking water, there could be no cheating. The net result—there were a lot of old folks. Thankfully most kids didn't choose immortality before they had a chance to experience a little of life. But the elders, boy there were a lot of them now and more every year. Too many, by Jorge's calculation.

Jorge had always been a practical man. Back in the day when he had a job as an engineer, trained to find the best solution for the available resources, he was renowned for coming up with the most efficient and useful answer. That training didn't die, and he could clearly see the problem. No new people, i.e., kids, no new ideas. No new ideas, so the world becomes static. Like watching re-run TV all the time, like listening to your Uncle Bill's same old jokes at every family get together, like boring with a capital B, and laying the pathway for the machines to take over from the old farts.

So, Jorge killed them.

He killed old folks. At first he tried to make it look like an accident. He'd push them in front of cars or off a roof. He'd poison them, electrocute them in the shower, give them drug overdoses, but that was all so time-consuming and so much work, so he'd taken up just shooting them. Shoot an old fart, make room for a new baby, maybe one with some new ideas, some new art, some new music, some new anything for god's sake.

Along with all the other improvements in life, guns got cleverer too. Now when someone got shot, the shooter had the option of knocking them down, or vaporizing them. Vaporizing was the most popular, left no evidence other than their burnt clothes, and non-destructible ID, and it reduced the demand for graves freeing up more land; Jorge vaporized them.

At first the news feeds made a big deal about the murders, but after a year or so of a couple of killings a day it wasn't newsworthy.

And Jorge knew he wasn't the only one with the idea.

He knew it when he happened to look down and saw the red laser dot on his chest.

●●●●●

Afterword

What do you feel your story requests of the future?
Communications and transparency with efficient and effective distribution of goods, and relief in times of stress or natural disaster.

What is the kind of future you hope to avoid?
The apocalyptic future of the destruction of civilization due to some catastrophe, warfare, pandemic, extraterrestrial attack, cybernetic revolt, or failed technological singularity.

What kind of future do you want to live in?
I'd like to see another level of evolution, or perhaps a technology-assisted evolution where mankind would develop an enlightenment brain layer or gene set. Enlightenment would mean we as a species would realize we are no longer hunted by wild animals, don't have to selfishly hoard food and resources, and don't have to fear and therefore be antagonistic to other tribes. Enlightenment would also mean we could grow beyond ancestor worship and not seek mysticism or religion to explain things we don't understand.

IMAGINING
THE
FUTURE AND
BUILDING
IT

INCIPIENT MARSUPIAL

BY ROGER KAY

6

Leather skins ruled the earth. Someday, humans would call this time the last days of the Cretaceous era, a period when minuscule sea animals were building layer after layer of chalk by bequeathing their lifework, their shells, to what ultimately became mighty cliffs and beds. But, for now, the animals alive had no idea what role they had as part of an inexorable life force moving toward the future, nor that, for almost all of them, the unexpected end would arrive with terrible suddenness.

"Do you see that, Zyphalon?" Old General Mughesal pointed significantly with his face, sad eyes drooping.

His best young warrior—the strongest, fastest, bravest—looked up.

They had trudged slowly into the canyon around a bend in the river and found there a slope of rock-fall. Halfway up, at a distance of two hundred meters, a tree lay across the broken scree.

On it, a small furry animal with oddly large eyes was holding a stem in fine fingers, trying to pluck a fruit out of its shell with its other hand. Its fingertips were odd, slightly wider than the shafts of the fingers themselves.

"Observe how it does that delicate work."

Zyphalon sighed.

At the same moment, their concentration shifted to their feet, of which they had four. Stumps, pretty nearly. Endings for legs designed to carry a heavy load, sturdy, padded, comfortable, but useless for precise tasks.

●●●●●

Their communication depended mostly on thought rather than sound. For, this species of three face-horns had evolved an organic network, the ability to communicate directly to each other with their minds, an electro-chemical emanation of waves that translated and communicated into a sea of other consciousnesses, all the product of the need for social interaction, the key to their survival.

Their ability to transmit was weak. At 40 meters, the signal dropped altogether. But the power of their reception was magnificent. The tiniest thread of a thought could be gathered in its entirety if it could be detected at all.

Millions of years of evolution had brought primitive visual signals up to the level of a language and, by the time the group had acquired the ability to intercommunicate with their minds, they had also established protocols for who would transmit when. The electro-chemistry took hardly any energy to sustain and, thanks to the universal rule of passing messages, anyone could communicate with anyone else at pretty much any distance—so long as a

chain of animals remained within range of each other—because each animal would pass all messages onward toward their intended recipient.

This wonderful ability was marred by a sadness, however. They were imprisoned in their bodies, which were designed for a brutal life upon the open grassland. The evolution of a communications system and a whole social order dependent upon it was relatively recent. Only in the past five million years had they been building their collective intelligence into an organism, something that could think better than any one of them ever could have.

And, of course, they had learned to organize into a coherent socialscape. Some of this was done through vocalizations, which, although primitive in terms of articulation and refinement, could carry much farther, since their voices tended to fall in the lower registers, a range that millions of years hence would be used by elephants and whales. With such cries, an individual could ask for the channel, and others could respond with signals that meant "go ahead," "ready soon," or "busy." Those interested or required to be involved could stomp toward each other so that everyone participating was close enough to pass the transmission around among themselves easily.

Grontonen, their leader for forty years, could summon everyone. He could take the whole channel himself at will. He saved that ability for the items of highest importance. Most of the time, the channels quietly hummed away at a lower level, families doing what they needed to, military subdivisions self-organizing, and various groups exchanging ideas on a more or less equal basis.

The oddest thing is that, despite having relatively small brains individually, their highly coordinated communication itself served as a kind of collective intelligence and, as a group, they could reason in quite an advanced way. Many of the adult males were repositories of specific information:

the edibility of individual plants, the danger of certain animals, the characteristics of a particular piece of geography, the order of a series of events that had occurred in the past. When queries came about, these individuals contributed their knowledge to the flow.

There were others—Ooma, the most senior female, among them—who had a different skill: the ability to find patterns or interesting relationships among all the knowledge that they shared among themselves. She and those like her could call attention to different things that, taken together, had significance for the tribe's welfare.

Their ability to communicate via weak radio waves—something that would ultimately leave no fossil record—was a direct result of their survival strategy, which was safety in numbers. The three face-horns—their huge bony heads and faces graced with three sharp horns—had learned over time that their best defense was to confront their enemies with a forest of faces. Facing outward, the males and non-breeding females could encircle the breeding females and youngsters, holding off any attack. As the perimeter was increased by adding a few more strong backs and sharp points on the front line, the safe interior grew, providing room for many more pregnant females and babies.

They lived on a tremendous open plain made up entirely of edible grass called poa. Each week, for most of each seasonal cycle, dozens of tasty types came into flower, all standing together on slim stalks, reaching for the sun. The food supply appeared unlimited.

From the swamp edge in the East to the mountains in the West, from the far south to the far north, was an ocean of poa. They trampled though it without thinking, simply to go from one place to another to enjoy more of it. So long as they stayed generally together, and closed ranks when an enemy

approached, there was little threat. And because this strategy worked so well, and food was so abundant, no number of them seemed to be too many. Small groups had joined together, swelling into the hundreds of thousands—and eventually a huge group measured in hundreds of millions lumbered around the plain.

The other leather skins had not evolved, at least not the same way. The gangs of belly rippers, with their hooked hangnail toes, had formed a primitive social organization that barely involved language. With grunts and wild cries, they applied their ripping claw, a deadly sharp razor on each nimble hind foot, cocked to disembowel in seconds. Given the weight of their hindquarters and the strength of their leg muscles, even a single slash often proved fatal.

One belly ripper screamed while another attacked, a third made a gambit, and by distraction, they confused their prey. They called to each other, passing fakes, feints, and fear back and forth, to terrifying results. Because their world depended on opportunism, they worked together up to the gang level, essentially the number which could keep an eye on one another, and attacked larger prey with speed and coordination. They divided their spoils roughly and parted company until the next feast.

Occasionally, more or less equal gangs would attack each other over hunting rights. Then, the carnage was nearly always complete. One or two might walk away with wounds insufficient to kill them in the short term, and they would do their best to form, with other loose rippers, a new alliance of convenience.

A phalanx of three face-horns could, of course, fend off such adolescent assaults, but single animals were at risk, and the belly rippers dined well.

Tyrant kings were another story. Because of their height, weight, and sheer muscle mass, they could take out an individual three face-horn. Not so, a barrier of horns.

A sharp memory returned to Mughesal of a time when he was caught out in the open with one. He was much younger and less experienced then.

The mighty animal was clearly starving and desperate. It would not normally try to take a three face-horn, even if it could, as the squat defenders inevitably put up a good fight and weren't that tasty to begin with, given their highly acidic and stringy flesh. Mughesal had just passed through a grove of cycads and was heading down an open slope toward the mouth of a canyon when the beast stepped out from behind a huge coniferous tree.

The tree was one of many in that area that had stood for thousands of years and was 10 meters across at its base. Both animals started in surprise, but almost immediately the tyrant king evaluated the risks and benefits of attacking a three face-horn and came to the conclusion—incorrectly, as it turned out—that the benefits outweighed the risks.

Mughesal watched the king's face as they took each other's measure. He saw the huge beast's expression evolve. First, it was startled. Then, it recognized Mughesal as potential food. Immediately, the seed of desire was planted in the king's primitive mind, which launched a simple plan to turn him into a meal.

The tyrant began to walk slowly, upright on his two powerful legs, his smaller arms hanging uselessly in front of him, the huge sabers of his teeth flashing a murderously maniacal grin.

Mughesal estimated his chances with various strategies. He could not outrun it, but he could delay the moment when it broke into a run by not running himself, by acting as if he were perfectly at his ease—just out for a casual stroll—and heading toward the mouth of the canyon. His turn was unhurried but efficient, and he started walking slowly, straight toward the canyon mouth.

If he could get close enough to the mouth, he could send a vocal emergency call. In fact, the three face-horns had a specific call for "emergency, tyrant king."

Taking strides as long as he could make them without increasing his pace, Mughesal covered ground deceptively quickly. He measured a hypnotizing pace, the slow rhythm of his feet signaling to his stupider adversary that he was not running away. He reached yet further, covering more ground with each step.

When he was within a half meter of the canyon entrance, he let out a long howl.

Immediately, he heard an answering howl, "We hear you. You have the channel. We are coming." His solid legs could stretch no further, and he began to increase his pace, still trying to keep his walk controlled.

The tyrant king, alert that something was up, increased its pace, and the ground between them began to close up.

When his pursuer was still twenty body-lengths behind him, the first maneuver team rumbled around the corner of the canyon's mouth, and Mughesal quickly established network communication with them.

"Come here quick, you two. We need to start a squad of horns."

"We've got others coming," they signaled back.

Mughesal turned to face his tormentor just as his cohort ran up to him. With practiced skill, they formed a triangle, facing out, and stood their ground.

The great king hesitated. He had witnessed a wall of horns forming before and knew there was no recourse. Even as his tiny brain was dealing with this news, five more three face-horns rounded the corner and quickly inserted themselves into the barrier, each warrior adjusting his angle and

position to accommodate the increased number. The density of the wall of horns increased.

By the time 10 more arrived, the phalanx was impregnable, and the tyrant king had already decided to go its way, seeking easier prey.

There was nothing subtle about the tyrant king's approach. But it was effective often enough to earn survival and prosperity for his kind as well as respect from all other animals and the tyrant kings had populated the world, driving many other, less efficient, killers out of existence along the way.

The tyrant king was a bully, no doubt about it, but big and tough was only one strategy.

Everything had its own way.

In addition to the gangs and bullies, there were ambush hunters, who waited in the shadows for a lone victim. Then lunged with sudden, terrible speed.

The egg eaters were cowardly predators. They wanted to eat animal, but weren't brave or strong enough to bring down desirable prey. If an egg eater found a nesting area, it waited quietly until a mother left a nest unguarded, if only for a moment. Then, it quickly punched an egg with its hard beak and sucked out all the contents in one swallow. If there was still time, they would do another. And so on, around the nest until the distressed mother came rumbling back. Then, they would scamper away on nimble legs.

They could get bashed with a tail if they gauged the situation wrong, but more often than not they got away with it.

Other meat-eating cowards picked carrion. A hunter normally disdained dead food. So, a scavenger had less competition if the animal was rotting.

Some hunters were stalkers, who patiently tracked their prey to its hideout, or ran them to ground through exhaustion.

The other large group of leather skins, vegetarians, were prey much of the time. But they had their strategies, too. Some were small and fast. They ran and hid.

A few prey animals were good at hiding in plain sight. Through color and texture and their ability to remain stock still when they wanted to, they could camouflage themselves to look like other things around them, from certain types of rocks prevalent in an area to some trees. Of course, ambush hunters used the same strategy. For some reason, the ambush hunters rarely ate the camouflaged hiders.

Then, there were the big bluffers who, lowering their heads, could look like much larger animals, and so scare off a potential attacker.

Some—like the long-necked swamp waders—were massive, slow, and powerful. Their tails were often club enough to bat away an attacker or deal it a crippling blow to one of its leg joints. But the prize of so much meat—sweet, tasty meat, at that—was worth the risk and skilled tyrant kings and belly rippers took them down from time to time. When one swamp wader was wounded past the point of no return, the others in its group would abandon it to the predators and move deeper into the swamp. Sometimes the attackers would drown, sinking into mud on feet not adapted to soft, churning swamp bottom. The waders, though heavy, had wide, flat feet, just made for holding up huge weight without sinking.

But among the vegetarians, the three face-horns had reached the pinnacle. In fact, as a tribe, no predator would attack them.

And this was because of their social organization. Their unique ability to act in concert meant the more of them there were, the safer they became.

●●●●●

Zyphalon and Mughesal were downwind of the small animal. They made no sound. They did not move. They simply looked.

"What is it?" Mughesal signaled back through the chain of his troop, which stretched back to the main body. "Anybody seen one?"

And the question was picked up by Sunanimo and his group of animal identifiers, three face-horns who carried visuals and information about other animals in their memories.

"Yes, we know it," said Sunanimo. "It's a fruit eater. It has fur. It pushes out live babies and feeds them from its body. It lives in holes in the ground."

"Holes in the ground," mused Mughesal. He thought of another time in another valley, near a riverbank, when he had had occasion to notice holes in the ground.

●●●●●

It was in a canyon they had visited on their stomp around the Western mountains.

Mughesal had found himself standing at the edge of a small pond. It was quiet when he stepped up, his aides holding themselves discreetly off to either side as he stood, listening. He noted that the far embankment, which rose up a gently sloping hill, had some holes in the side near the water.

As he stood there, he saw small furry animals come and go from these holes, dropping into the water and swimming underneath until they arrived at a flatter part of the shoreline, where they emerged from the water, shook themselves off, and dashed into the plant cover.

He also observed some smooth-skinned amphibians, sitting in the water, unmoving, only their eyes and noses raised above the waterline. They were

breathing quietly—partially through their mouths, which were slightly open and drew oxygen from the air, and partially through their skins, which converted oxygen from the water—aware that some larger animals were in the area.

As he watched, Mughesal realized that two of these small animals were looking at him sidelong, watching his every move. One was a furry animal sitting at the mouth of its hole. It looked up at him fearfully and began to shiver, ready to bolt. The other, an amphibian, sat on a partially underwater log. The creature rolled its eyes back at him, but sat there, steady as a rock.

"Is that defiance?" Mughesal thought.

One animal seemed afraid of him; the other not.

He wondered if there were any advantage to smallness that he hadn't thought about.

He could not know that both these animals would survive him and all his kind.

He did not know how soon.

But there had been a growing sense of dread in the tribe for a long time. They could not feel the approach of sudden doom, but they were aware of a slowly encroaching catastrophe. And this is why Mughesal was on this mission. He had been sent out with a brigade to test the most promising part of the perimeter, the Western mountains. He had to seek a food alternative. All their poa was at risk.

He learned of his mission when Grontonen had assembled the entire tribe a half-year ago. At that time, the great chief had gathered everyone together—from the farthest reaches of the sea of poa—into a huge knot of animals, herding together on the open plain. Hundreds of millions of beating hearts.

●●●●●

The place was special. It had been a gathering point for millennia. Although the basin of poa was unbroken and nearly flat for a hundred kilometers in every direction, right in the middle of this vast plain a rock outcropping broke through the earth. This feature, an escarpment, had been formed when a twist of the earth millions of years before tore out and upended the solid layers of even older mud compressed into thin, multicolored layers. These layers now formed the face of a cliff 30 meters high, which could be reached by walking up the long slope behind it.

From his perch at the edge of the cliff, Grontonen took the channel and began beaming to the multitude below him.

"Children!" He waited as the signal was passed through the enormous crowd to those at the very edge. "I have not taken the whole channel to speak to you for many years. The last time was when the great sickness took so many of us and we had to separate the ill ones from the rest and leave them in the high desert. It was a difficult time and we had to work through it until we all understood and agreed on what had to be done, even—no, particularly—those who had to go into exile.

"I believe they all died eventually. The poa up there is neither plentiful nor sweet, it is not the kind that sustains us, and they were quite weak. The last time we sent an expedition out that way, it could not pick up a signal. Just silence.

"I call for the whole channel only if the situation is serious, and now it is serious.

"As you know, we live in a long flat valley. It lies between the mountains to the West and the lake to the east, and runs from the salt water in the South to the swampland in the North. Our valley is a tremendous waving sea of poa.

"It has been good to us, allowing us to grow into a vast number."

Grontonen looked out over the sea of horns. As far as he could see, they were held in the air. All of them were there. They had been summoned in from afar, vocal signals passed back until network connections were established all along the way, and the herd collapsed down into a central knot as everyone along the perimeter moved toward the center.

He didn't know exactly why this place had become the center. He knew it could not have always been here but there was precious little in the archive, other than a myth of the founding group saying it had risen at the call of an ancestor. He didn't believe that. He knew that it must have been there already for untold countless years. The real story was lost in time.

A well-worn path led up the slope, packed down to the point of being shiny from the thousands of three face-horn feet that had trudged up and down it.

From the top, Grontonen could see everywhere, and, as he spoke, he turned occasionally in every direction to make sure that those nearby got fresh, clear signals. His technique, established over many years, lent him presence. It was so distinct, anyone in the tribe could recognize it in just a few seconds.

"We have grown and prospered. Safety in numbers was the right strategy for us. It has paid off well.

"But now we need to take a different path. Our explorers have determined that all our good poa lies in this one flat valley, and it is all extremely low. In fact, from the South, there is only a thin wall of sand keeping the salt water out,

and if that wall were breached, then that water would pour in and could wash up the entire valley, killing most of the poa.

"We think that the wall is getting thinner, that the land is separating, and that it is only a matter of time before the salt water gets in. We have some time left, but we must find a way around this. We have far too many mouths to feed if we lose most of our only food. Having defeated even the most wily and aggressive predators, we suddenly find ourselves facing a problem that we didn't know existed.

"We must do two things: we must verify whether and by how much the wall is weakening, trying to understand when the flood will occur, and we must seek an alternative for poa. Either we must carry some up to higher plateaus and try to grow it; or we must find something we can eat that grows at higher elevation.

"For this reason, I am sending out Mughesal and a brigade of his best soldiers to examine the Western border, the canyon land that leads up to higher mesas and eventually mountains. There is nothing in the East, save lowland swamp. That area will drown first.

"Thus, he must travel down the West side of the perimeter, probing the valleys, and seeing whether he can find suitable alternative sustenance or a way to carry poa up to higher valleys. And, he must also inspect the South to see what state the wall is in and try to estimate how long we have.

"There's no doubt about it, Children. We will lose our poa. It's only a matter of time."

In the silence that followed there was a rumbling from the back of the crowd. Ooma was asking for the channel. Grontonen, not a natural autocrat, immediately yielded.

"Three face-horns," she modulated, getting their attention. Her waves were relayed from edge to center, along the edge, and through intermediate pathways, echoing inward and outward repeatedly across the crowd. "Go forth and multiply has been a fruitful strategy for us. But now our numbers are against us. We must go forth and divide.

"We must not let our eggs bring forth new life. Each family must stomp their eggs, leaving only one in each brood. We must begin to reduce our numbers. If we lose most of the poa, a small number might still survive. And perhaps we can find a way to make poa grow in the higher valleys. It is the only way."

A murmur started up in the crowd. It grew louder. This was unheard of! For as long as the tribe had records, the only imperative had been to grow, grow! More was always better. There was enough food for everyone, the only weakness being their lack of numbers. More of them! That is what was called for. Then, they could defend themselves against the other leather skins, who were relentless in their quest for flesh to eat.

And now, turn all of that on its head? Do exactly the opposite? It was unthinkable.

Ooma signaled again. "No, children, it is true. We must do this for the survival of the tribe, and everyone must help. Rogues cannot go their own way. We are in this together. We must do this as one.

"I appeal to you, females of the tribe, you who provide our eggs and most closely nurture our young. You must carry this initiative forward. Educate and soothe your males. I ask you for all of us."

She stopped. Grontonen nodded.

Then he relinquished the channel, opening it up.

Waves of signals came pouring through. Everyone was transmitting at once. Reception was difficult.

In the end, it all got sorted out. Questions were answered, objections addressed, and fears assuaged. Gradually, a consensus was reached among that vast throng. They would carry forward with population reduction, poa cultivation experiments, and another perimeter assessment.

"Otherwise, we will not survive," Grontonen emitted. "Mughesal, gather your best troops and meet with me to discuss details. You'll leave in the morning. Thank you, everyone."

●●●●●

Mughesal and his brigade set out on their mission. Their ability to work together was what distinguished them from all the other leather skins, even their near cousins, of which there were many. Self organization had grown as the three face-horns learned to use their electro-chemical radio abilities. From the recognition that they could all perceive each other's minds and send and receive signals on a common channel, they figured out how to turn themselves into a self-regulating network of near-equals.

However, they could easily form a hierarchy. Based mostly on age and experience, they had an order. Between any two, in military circumstances, both knew who was senior. This trait allowed them to act quickly.

The perimeter itself had been established during the pack's many years of scoping the terrain, seeing where the water came in and how the basic region was shaped. They even had a map of it, carried in the heads of place memorizers. This group had specialized over time in keeping physical layout memory written in patterns of neuron firings that remained remarkably persistent over years of time. Although each held only a small piece of grid in

his mind, they could all transmit together so others could read map detail at any scale.

A large, uneven Western border was marked by mountains, cliffs, and escarpments, the edge from where all water came down. These mountains descended toward the center, composed of rolling and eventually flat lowlands covered with poa, whose meadows gradually dropped down into a long, shallow lake. When the air was still, they could walk out for a mile in it, so gradual was the grade. They could not see across it, and no one had been out beyond the point where it was no longer possible to stand on the bottom and keep at least one nostril above the waterline. Their territory ran North to South for thousands of miles. The Far North became too swampy to ford, and they had not explored any further. The South ended at a low barrier of rocky debris, left there by tidal events and ancient washout.

Beyond the last low ridge, lay salt sea. Just a thin line of barrier of rocky debris, scarcely twenty feet high, stood between them and trillions of gallons of salt water.

Recently, that perimeter grid pattern had been called up numerous times, as Grontonen and Oom, his chief advisor, had gone over the details with many different groups. The basin had been widening slowly for years. It was extraordinarily flat and low.

It dawned on them that when the earth finally tore open, their entire living space would be flooded. Almost all the poa would drown within days, and they would devour the tiny remaining fringe in a week.

How to ameliorate the situation? How to figure this out? They kept worrying the problem.

Now, Mughesal and several thousand seasoned veterans were stomping the Western edge once more to see if there was any higher plateau where they

could carry some poa in the hope that they could make it grow there. In the South, they were to verify how fast the barrier was tearing.

The days of safety in numbers were over. The pack faced checkmate and time was the enemy.

Their experiments on the Western border came to naught. They had found some upper valleys that seemed promising, not too much cooler than the plain below and nourished with good flowing water and long, flat stretches on each side that might sustain poa. But they could not keep it alive for the amount of time it took to carry it up from below in their mouths. When they set it down, it just died on the ground. Poa was adapted to the soil, temperature, and humidity of the plain, and the three face-horns didn't have the skills to make it grow elsewhere.

Some on the mission became pessimistic about their chances over the long term. Others wondered at how, even this late in the game, when the end seemed inevitable, the things they needed were still plentiful and the world was still incredibly beautiful.

They continued their trudge to the South.

As they emerged from another dry canyon, Zyphalon and Mughesal fell in together.

"Have you noticed that we don't see the Small Runners anymore?" Zyphalon sent to Mughesal. "They used to be all over the place here at the Western edge. I haven't seen one in years."

Mughesal thought for a moment. "Yes, they used to be plentiful, and now they are gone. Others are gone, too. The predators have multiplied and eaten everything they could. There are many fewer types of animals now than there used to be. That concerns me.

"The web of life was richer, more complex at an earlier time. It feels as if we have walked out on a long ridge that comes to a narrow point, and we can't turn around and go back. That feeling disturbs me, haunts my sleep."

●●●●●

But it turned out that whatever choices they made—whether right or wrong, whether solving the crisis of food and population, of increasing fragility in the food web, and of loss of species, whether, finally, a great galactic witness or something else loved them or loved them not—all their struggles were in vain.

●●●●●

From beyond the range of the animals' experience came the comet.

A ball of ice and rock as large as a mountain flew in from outer space.

A mountain is large, but not unimaginable. And in the days before it hit, the ice ball was visible at certain times of day—to those who looked—as a growing point of light in the sky. Even in space, minuscule fragments flew off it in the solar wind, making a bright tail, and sunlight reflected from it like a tiny moon.

But what sealed the fate of life then on earth was its speed. The force generated by that combination—the size of the projectile and its velocity—would drive it deep into the planet.

Inexorable.

The huge mass tore through the air. From the moment it touched the first wisps of earthly atmosphere 180 kilometers above the surface, through progressively thicker layers, until its leading edge kissed the earth—enough time elapsed for only a single heartbeat of the largest animal.

In that moment, on its way down through the air, the ball of rock and ice was transformed into a ball of fire.

The terrifying projectile bore down on the air in its path, compressing it in one shock. This shock-compressed air set off a searing flash, the heat of which—for a few grilling moments—was beyond that of the sun. Anything in a direct line of sight was roasted instantly.

The air's sudden compression set off an enormous sonic boom—the voice of God heralding the end of an era.

From the first moment that the fiery sphere's leading edge hit the shallow sea at the point of impact until the back end of it passed below the surface of the seabed, a half a heartbeat passed.

The force punctured the planet, opening a huge, expanding, flaming hole in the earth.

The blow unleashed in all directions shockwaves that reorganized minerals in their path within seconds.

The apocalyptic release of energy continued: a hundred million megaton force, shattering everything.

In another heartbeat, on its way toward drilling a hole in the earth 40 kilometers deep, the massive space bullet vaporized, also vaporizing, melting, and tearing apart tons of target rock in its way.

As the forward shock tore into the earth, an explosion occurred at the surface, as the reaction shock flew backward toward space. The earth's mass generated a blazing wave of energy that shot back up into the sucking column of vacuum through which the no-longer-existing bolide had just flown. The reaction's bow wave led a hot-gas fireball, a huge cloud of vaporized rock generated at ground zero, that blew right through the entire blanket of air—

carrying with it rock melt and fragments of all sizes—on its way back out into space, where the debris was carried around the globe for thousands of miles before materials precipitated from this cloud and fell back down to earth.

Almost immediately another fireball exploded as the forward shock vaporized the deep bed of limestone just below the surface, releasing carbon-dioxide gas like a giant bottle of celebratory Champagne. This explosion threw more rock fragments aloft.

Shock waves threw up debris on trajectories that would carry it beyond the atmosphere before letting it drop in all parts of the globe. The heavier material—melted blobs and solid fragments—reached for outer space before blanketing the earth all around the hole for hundreds of miles. The lighter fragments stayed aloft longer.

In the minutes after the first shock, the drama continued to unfold.

The initial deep puncture began to fill in, as its unstable walls buckled and the shock carried outward. Within minutes, the remaining crater was more than 100 miles wide, but much shallower.

In the center of the crater, the reaction shock carried a spike of molten material straight up. Unstable, this mountain began to collapse upon itself, forming a widening series of rings around the central peak.

Although the shallow sea where the projectile hit was vaporized instantly, the boundaries of the hole in the water became the leading edge of a tsunami, which gathered force as shocked earth under the sea shook deeper parts of the water. Huge waves raced toward shore, where they caused massive undersea landslides and reached far inland, washing away everything in their path.

Before it was through imparting its energy, the boom of seismic shock rippled all the way through to the other side of the planet, gathering force from a lensing effect due to the roundness of the globe. At the antipode, on the far side of the world, this focused force struck under the ocean. The sea floor shoved up with a crack, unfurling a second massive tsunami that engulfed miles of surrounding shoreline within minutes and continued to wash over vast swaths of coast and far inland for hours afterward.

The entire planet reverberated like a gong.

But the pyrotechnic show was far from over.

The lighter material that had been thrown into space began to come down as a rain of rock, which fell everywhere on earth. Some of this rain was made up of black glass, disorganized minerals that cooled too quickly to allow crystals to form. Some of the lethal downpour was made of crystals that formed as material spun, twisted, and spiraled through the air. Some of it was just particles the size of dust grains.

And as this particulate cloud reentered the atmosphere, it encountered air, which tried to slow it, creating friction that generated heat. The sky began to glow, faintly at first, and then more strongly, until the sky became a broiler, roasting everything in the open.

●●●●●

At the moment of impact, Mughesal's troop was close to the southern end of the three face-horns' territory, just a hundred miles from the old seawall.

As they looked up, the flash blinded, then roasted them, and in another half minute, they were gone, cremated even before the second limestone explosion.

Further up the plain, the main group saw the flash beyond the horizon. Immediately, panic at the magnitude of the unknown light set in, jamming the network. No one could understand anything. Armageddon arrived from two quarters, one closely after the other.

First, the sky began to glow and heat up. The panicked tribe stampeded toward the lakes. Those near enough had time to rush into the water, only to have it heat up and boil them only minutes after the ones unlucky enough to be further away were grilled.

Within an hour, the great tsunami washed up the valley and carried away the remains of all animals roasted in the central plain. Within two hours, a raging wave of water, mud, and uprooted trees had scoured to the farthest end of the valley, wiping it clean of any evidence that the tribe had ever even lived there.

Just like that, the three face-horns ceased to exist.

Tsunami, unleashed by the impact, crashed into shores near and far, some up to 10 thousand kilometers away, washing away all coastal life and disrupting the marine environment.

But in one odd part of the world, far inland, not near the point of impact, nor the antipode on the far side of the sphere, some cousins survived for a while.

These cousins were the one face-horns. A small tribe of them were just far enough away from the most devastating forces so that they made it through those first hours of the new era.

Their great good luck, if you could call it that, was that they were huddling together in the midst of a heavy rainstorm. They had been standing for hours in the downpour, thick clouds hundreds of miles wide dumping torrents onto their backs.

They felt the jolt, which moved everything and caused some of the young and the very old to stumble and fall to the ground. Others shifted back and forth as the waves of seismic movement passed through.

When the thrown material began to fall to earth, it did indeed heat up and brighten the sky, but as it ran into the water vapor in the clouds, it cooled with a hiss. Only the larger bits fell to earth through the dense clouds.

A few of the one face-horns were killed and many were injured, as stones of various sizes shot through them. But most were unharmed.

Which meant that they were then alive to witness the parade of horrors that followed.

Pretty much anything combustible caught fire and burned for days, emitting black smoke that filled the sky. Forests everywhere went up in flames. Only those patches that had been under heavy cloud cover remained at all.

However, after a few days, the immediate effects of the collision died down. Fires went out. The tsunami waves spent their energy. The violent winds settled down.

But a new terror took the place of the inferno. The earth began to turn cold and dark. Fine dust, settling through the upper atmosphere around the world, blocked the sun completely. On the ground, it was so dark that surviving animals could see nothing but blackness. Without sunlight, a deathly cold gripped an earth that at that time still had no ice.

None of the animals were prepared to live in such conditions. With their cold blood, they had no means to generate their own warmth. The surviving one face-horns slowed down until they stopped moving and dropped one by one, their hearts ceasing to beat.

The cold lasted for months. Vast quantities of dust, water vapor, and carbon dioxide from the impact site hung in the air. The water vapor was removed fairly quickly as rain, which poured down on the burned debris of formerly living things, washing it all into streams and rivers and forming a huge muddy wasteland.

For months, the rain washed out the dust.

Finally, the light returned. It shone on a surface nearly devoid of life.

And slowly at first, then more quickly, the temperature began to swing from teeth-chattering cold to a sweltering soup.

Carbon dioxide, millions of tons of which had been hurled into the sky on impact, hung in the air, trapping heat from the sun. The atmosphere was thick and sour.

Carbonic acid, the product of limestone and water vapor thrown into the air at the impact site, formed in this soup. Nitrogen in the air, heated by the event, broke up and combined with oxygen to form nitrous oxide, which in turn combined with water vapor to form nitric acid.

These poisons fell from sky, killing any plants and animals left on the surface, and dissolving even rock, adding a finality to the vast death that had overcome the world.

This series of catastrophic events was a whipsaw from which few things could recover. First, shock, grilling heat, and a rain of burning rock. Then, a world dark and frozen. Finally, a long period of hot steamy weather with air and water poisoned by acid and soot.

During the terrible period, half the types of living things perished forever.

No animal heavier than 25 kilograms survived. Many things in the sea, but even more of those on land, died.

The earth baked for thousands of years before the carbon-dioxide dropped to the level of before the meteor.

A few birds were able to fly away from the worst, seek shelter, and search for food opportunistically. Some survived.

Some seeds lay buried in the soil so that they were protected and, after the heavy rains, they began to sprout. Some of these plants were able to adapt to the new conditions.

Roots of large trees also, after a period of dormancy, began to send up new shoots, and some of the more robust species made it.

●●●●●

At the first sign of tremors in the earth, the amphibians dove into the mud. There, they slept for months, scarcely breathing.

Deep in their holes the incipient marsupials shivered in fear. The store of nuts laid aside would come in handy once hunger overcame fright.

On the surface, the life they knew had been blown away.

But, in time, they would inherit a new and completely changed world.

●●●●●

Afterword

"Incipient Marsupial" is actually a treatment for a much longer work, *Dinosaur Catechism*, which will go into much greater detail on the survival strategies and response to change of the great triceratops herd and their various adversaries.

The story is set in the distant past, a time safely removed from our own, and that is deliberate. However, the tribe I had in mind when conceiving of the idea was homo sapiens, of course. And the uncertainty the animals face represents our future.

By setting most of the action in the years and months before the Chicxulub meteor, I put my very thoughtful and interconnected tribe on a path toward certain doom, a doom that the reader knows about but that the protagonists do not.

The questions raised read like the ones we humans face today: should we just eat, drink and be merry for tomorrow we die (which might have been the right response for the herd, but how could they know?) or should we try to preserve our ecosystem, reduce our numbers, strike some kind of balance with the idea in mind of keeping our race intact for as long as possible?

T.S. Eliot, in "The Hollow Men," wrote, "This is the way the world ends…Not with a bang but a whimper." But how could he know? Many people think, tacitly or explicitly, "Après moi, le deluge," attributed to Louis XV, king of France. Hitler was known to have accelerated his "program" when he felt his own mortality. And so the natural tendency is for humans not to conserve for the future but to say, "I don't care what happens to the world after I'm gone." But they mistake their own demise for the demise of everything. And Eliot gave us the comfortable idea that things would just meander on rather than come to a definitive conclusion.

What "Incipient Marsupial" asks of the future is that people act more collectively in the best interest of the whole tribe, that they forgo a little of their own selfish satisfaction for a bit more general good. Despite facing total annihilation, that we act as if there will be a future that our progeny will inherit and that we want it to be a good future, a nice place that we ourselves would like to live in, maybe even better than the present in which we actually live.

The non-triceratops actors—the deinonychus, T-Rex, and others—are seen as primitive, lesser beings, motivated solely by short-term gains, lacking in trust among themselves, and having no sense of the future. Although Sparta beat Athens in ancient Greece, in my narrative, enlightenment is equal to strength. There really is safety in numbers, if everyone acts together.

The technology involved in the story, such as it is, is essentially wireless networking. The plot device gives the triceratops a way to communicate in a highly sophisticated way and yet leave no trace in meatspace, making the whole thing more plausible. Archeologists would never detect the capability in the fossil record. The players have language but no mouths to articulate it. They have minds but no hands to carry out their ideas. Some reference is made to the electro-chemistry of biological systems as well as early data communications protocols.

My hope is that technology can be used for good. At the moment, much of it seems focused on evil (e.g., weapons systems) or trivia (e.g., mindless chat and photo sharing on social networks.) Could interconnectedness lead to greater empathy? That would be nice.

●●●●●

Names:

Grontonen—the leader
Mulghesal—the old general
Styroban—young warrior from the tribe of Grontonen
Zyphalon—key warrior
Oom—old advisor
Sunanima—other female
Sunanimo—other male
Ooma—senior female
Petronnemo—other male
Antauf—the scout
Malantauf—the laggard
Poa—their herb

Groupings:

Tribe
Herd
Cousins
Maneuver team—2
Fireteam—4
Squad, patrol—8-13
Platoon, troop —26-55
Company, squadron —8-225
Battalion—300-1,300
Brigade—3,000-5,000
Division—10,000-15,000
Corps—20,000-45,000
Army—400,000-1 million
Region—1 million - 10 million
Squad of horns
Wall of horns
Phalanx of horns
Forest of horns
Sea of horns

IMAGINING
THE
FUTURE AND
BUILDING
IT

DREAMWEAVER

BY ROB ENDERLE

This was the day. For as long as he could remember everything he had ever wanted and worked for was tied up in this one event. He prayed to whatever gods still existed that he would be good enough. While it was said you could always try again few ever got one chance let alone two and the list of candidates was in the thousands. He'd win or his life, as he knew it, was over and he pushed those doubts aside as the clock counted down to the start of his trial.

As he waited, his mind wandered back to when it had all begun, when he realized he wanted to be a dreamer, no—more than a dreamer, he wanted to be a Sr. Master Dreamer, he wanted to be a god.

In the Beginning

Robert was blessed with dreaming lucidly and in color, this was a requirement for a dreamer and once he shared this ability with his parents,

both of whom were dreamers themselves, there seemed little doubt that their little boy, as most parents believe, would achieve greatness. Dreamers were still rare, the technology for instant rendering still relatively new and mostly used to enhance movies not create them. An extension of CGI dreamers could create living landscapes and even stock characters with which they would populate the movies' virtual worlds.

In the 2020s, which is when the lines between movies and video games began to become truly blurred, allowing players after watching a movie to actually participate in key movie elements, the career of Dreamer was established and they began to replace animators, actors, directors and the various other jobs tied to the prior technology.

By 2025, or when Robert reached his 5th birthday and began sharing his talent, classes of dreamers had emerged. You had Character Dreamers, those who created the people in crowds, or bystanders not critical to the plot line but critical to the reality of the story; Architectural Dreamers, who created the buildings down to their physical aspects (like how they might sway in the wind, react to a storm, or explode); Green Dreamers, who worked on plants and trees; Animal Dreamers (nicknamed Beastmasters,) who handled pets, wild animals, and sea creatures; Fantasy Dreamers, a unique specialty sub-group offshoot, who handled things that didn't exist in reality; and their variant Science Fiction Dreamers, who focused on future visions and had their own specialties ranging from Vernian (Steam Punk) to Trekkies, named after an old TV series and focused on the future as it might be centuries hence.

Over these groups, in a role that was once called a director was the Master Dreamer. This was someone who had developed skills in multiple areas and could actually create a major character. They often worked with Actors as proxies for the Characters they created but in the end they ensured that the

lead roles were believable and had a semblance of life. In some cases, the characters they created had virtual lives and watching them largely replaced reality TV shows by the late 2020s.

Above the Master Dreamer was the Senior Master Dreamer, also called a DreamWeaver. Because, while even the Master Dreamer required a writer to create a story, the DreamWeaver created from scratch. In short, they treated the Medium like a canvas and the worlds they created virtually were amazing and living things. What made Dream different from an old movie was that while it looked real every aspect of the creation was created virtually. There were no live actors, animals, sets and often the idea actually came from a dream but that wasn't a requirement. This was the translation of imagination directly to video; it still took hundreds of people to create a major production because people could now, after watching the DreamWeaver's view, buy rights to wander through, play in, and explore the virtual world that was created. Much like in a real dream, control of the environment was limited but unlike in a dream, dreamers (players) could interact virtually.

Every year the three best Master Dreamers competed in front of the world, judged by the few DreamWeavers and some years even the best wasn't good enough to get the title. That was why in the ten years since the creation of the title there were only 6 DreamWeavers awarded this prestigious title.

Robert had spent his life for this one chance—and he was going to intentionally lose.

Becoming a Dreamer

Robert Bingham started as most Dreamers start with Wallscapes. These are typically recurring digital images put behind false windows or wrapped around, in IMAX fashion, a balcony or large picture window showcasing a

perfect view. You couldn't just loop a picture because even if the loop was hours long it would recur and while you could stream an image the data cost in what was still a data-constrained world was prohibitive. That didn't stop the very rich from doing this anyway but a Wallscaper, kind of an apprentice Dreamer, could create an ever-changing image that either automatically switched seasons or shifted the weather on demand.

With the right projectors, screens and sound systems you couldn't tell the difference between a good Wallscape and a real view unless you opened the window or stepped outside. (Some did try to include water spray and limited smells but the cost was prohibitive, it worked irregularly and the moisture tended to rust the hardware). With a good Wallscape you could have a basement apartment and still have a penthouse view and you neither had the cost of the penthouse nor the noise associated with storms or winds, unless you wanted them. Every day could be spring and with photorealistic imaging and sunlight spec light sources you could even get a tan or better overcome the winter blues because, in your home, every window led to summer.

Robert's big break came by accident. He had been asked by a woman to create a unique ocean view. She was thinking of a beautiful purple beach or some such and he created a view of Atlantis. But this Atlantis was at war with nature, sea monsters, space aliens, and the occasional Nemo Nautilus. Each battle was different and even the attackers changed both in shape and tactics. Sometimes the city won, others it sank into the sea only to be reborn in the morning. The woman's boyfriend was a master dreamer and, after seeing the Wallscape, offered to mentor Robert only to find he was only 12 years old.

Becoming a Master

What made a Master different than any other dreamer is that they could create the semblance of life in their creation. A good dreamer could create

a dog that looked real, a Master Dreamer could create one that you wanted and longed for as a pet. They had the ability to engage the observer and it was far from a trivial task because every character they created had to not only mimic life it had to be a star. Robert's crowning achievement in that regard came at age 18 when he created a virtual pet for an elderly woman who had gone nearly catatonic when her elderly cat died. He created such an exact duplicate that the woman, until she died, thought he had brought her Sylvester back to life and wouldn't accept any argument that he hadn't. As it turned out, she was a very wealthy woman and was so grateful she left Robert a trust that assured he would never want for anything.

At 22, Robert became the youngest Master and participated in making some of the most popular Dreams ever released into the market. His mentor, who had been selected to compete for Senior Master Dreamer in one of the years when none was selected, nominated Robert for the trial. The Judges were impressed with his work and, at 24, his nomination was accepted. He'd have a year to prepare a one-hour submission and he'd be up against 2 other unnamed candidates with no promise that any of them would be good enough.

He spent the first 3 months going over the prior winning Dreams in detail, the second 3 months crafting a strategy and the last 6 months building an unorthodox response. He couldn't be sure of winning but he could be sure of having a submission few would ever forget. Robert was to go last and suddenly he regretted not going to the bathroom prior to coming up on stage.

The Stage

Something needs to be said about the virtual stage upon which these creations would be shared. Backed by the single largest and most advanced render farm currently in existence the stage was virtual and broadcast real

time to the millions watching the event from their homes, digital theaters, and offices. Much like a sporting event of old this once a year event was attended world-wide and for the next 4 hours would be the talk of the planet. No one time-shifted this event because everyone wanted to be able to comment about it on their chosen social network real-time and the event had been known to create social networking stars as it ran and people flocked to the commentary they most agreed or disagreed with, driving commentary and advertising revenues.

Unlike a commercial Dream these competitive dreams, at least initially, didn't have product placement or advertising inside because they were intended to be the sole creation of the artist. However, advertisers, upon learning of the contestants, would offer huge sums for exclusive placement and, win or lose, these sums typically got at least one major brand in each Dream. There was also, unlike in commercial Dreams, no way to pay to eliminate the placement and, given the massive audience, even at these astronomical rates the fees were seen as something of a bargain. The winner would receive a bonus of up to 10 times the base fee and, given the amount of betting that surrounded the event, both legal and illegal, the total dollars involved likely exceeded some small country's gross national product.

Presenter One: Master Dreamer Jeremy Ho

Jeremy was known for his risky creations and was expected to either win or fail spectacularly at the event. He might not get the title but no one doubted his ability nor that he would enter this competition with a vengeance. His most infamous piece to date was a space opera where the hero was a vampire who dined on children in order to gain the strength needed to repel an alien invasion. It was brilliantly crafted with the children appearing so real and tragic, and the vampire hero so conflicted that it was both painful and

compelling. But in the end it was so disturbing that it was widely panned even though it was also widely watched, largely because it had been banned in most developed countries and many undeveloped ones. Fortunately, most of his other works, while equally inspired, were far less upsetting. But, and this should be noted, his willingness to challenge what was accepted was likely what got him into this contest.

As was tradition he, or his avatar, stepped on the virtual stage and said "In the beginning…"

And the world-wide screens went blank. A cloudy being emerged from the blankness and clapped its hands, from the clap the solar systems and galaxies emerged. A planet rotated, it was the first day. Robert sat transfixed, Jeremy had created a Dream blending Evolution and Creation showing how both could be equally true by taking liberties as to what a day was and defining God as a combination race memory and unique telepathic ability from early man that resulted from inbreeding. Satan was the self-destructive side of this human gestalt but nonetheless real and hovered over the depictions of major wars. While the pace was frantic it would slow at key points in the story to describe a pivotal event—the death of the dinosaurs, the birth of man, the fall of Atlantis and the great flood—and on through to a future where the race ended but where those enlightened few evolved into something else to complete the rapture. It pretty much upset creationists and evolutionists equally and the social networks were ablaze with commentary. Whether it won or not the content would likely be debated for years and it wouldn't soon be forgotten.

2nd Contestant: Francine Denube

Francine was European and stunning to look at. While it was widely held that her beauty was artificially enhanced, this wasn't true; she was a natural

beauty and naturally didn't feel it was anyone's business. Like many in her profession she preferred her creations to get the publicity and not herself. Her fame was the result of creating a compelling series of twenty Dreams in series, telling the story of a young Warlock who was in a forbidden love with a vampire while both worked secretly together to subvert the evil doings of both of their families and protect the human race. Both had other contestants for their love—an Angel loved the Vampire and could make her an angel should she switch partners and a Fairy loved the Warlock—and both often worked behind the scenes to sabotage the secret relationship. There were massive fan bases not only for every character but for every relationship combination, even the remote chance the Fairy and Vampire hooked up (and there were a number of unapproved X-rated dreams that explored that and other more dramatic couplings further.) The series was called Dark Magic Pure Love or DMPL for short.

Francine's back story was tragic. Orphaned at an early age, she had been unlucky with friends and she'd had an early love that had also ended badly. She tended to be reclusive, working on projects remotely and while not known as difficult the word distant described her, and perhaps sad. Yes, definitely sad.

She got up on stage and said "Don't worry, it won't really end this way." And the screens once again went black then opened to the familiar start of the DMPL series. Since it was her creation, this was allowed but the work had to be unique, which troubled the bloggers and social network commentators. What happened next was forever known as DMPL meets Laughalot (a popular comedy series somewhat similar to a blend of Monty Python, the Three Stooges, and Abbott and Costello.)

A misplaced spell causes all to switch bodies repeatedly at random times and at critical moments like right before a kiss, or while meeting a critical

family member or fighting a battle. One particularly funny repeating scene is whenever the Fairy, no matter which body she is in, says a questionable word a pigeon flies out of her mouth and poops on the Wizard's head. This apparently turned into a drinking game in many venues. The film is full of sight gags, slapstick, and unexpected events (and one time the Fairy gets gas and takes out an assassin stalking the wizard with a barrage of magical blueberries that come noisily out of her… Well, you get the point. While much of the fan base was appalled the people who thought the fans were a bit nuts loved it and making fun of her own life's work in what was a new medium for Francine fit the requirements.

3rd and Final Contestant: Robert Bingham

Robert was known at large for creating amazing Characters. His specialty was people who seemed to have more life and more unique flaws than most. As such, even though a recognized Master, he had made few films and he had assisted in his Mentor's films many of which had won awards. Many thought he was unqualified to even be in the competition and, given he was a full two decades younger than the other contestants, most also thought he was simply too young to perform at this level. What got him into this competition were the collective efforts of the other Masters who credited much of their success to his character creation. It wasn't unusual to receive marriage proposals for his leading characters because people refused to believe they weren't both alive and their long lost soul mate.

As Francine started to leave the stage Robert asked her to stay. This was unheard of and the world paused to see what would happen next. He then asked her to describe the perfect dreamer. Behind them a silver pool formed. She thought and said the perfect dreamer had imagination, purpose, the ability to put life into images, and the ability to make people believe in a

world they created and in everything the viewer saw and that acted behind the scenes. It was a person who could create magic and touch people in ways they would never forget. In the end, the perfect dreamer was someone who could change your life with their creation.

Before I tell you what comes next you need to know something more about Francine. While beautiful, she had learned to distrust men early on because her beauty seemed to attract the wrong kind of attention and if her beauty didn't intimidate some men her capability did because, like Robert, she had been a child prodigy. Her rich parents had funded her education and set her up for life but didn't seem to want to spend time with her making her both resent them and distrust relationships. She wasn't an orphan, really, but somehow it was worse to have parents who wanted nothing to do with her life. She had loved once but the man she loved left her at the altar and she never saw him again. She lived her work and while she had many fans she had few close friends and lived a very lonely life.

Robert then said "Forgive me." and the screen came alive with the birth of a child. It then went through each tragic event but covered the back story that Francine hadn't seen. The early boyfriend who hurt her was himself abused and the guilt of what he had done haunted him to an early death. Her parents had avoided her because, while wealthy, they were political targets and they realized early on if she was to achieve her dreams they had to be out of the picture. It wasn't that they didn't love her it was that their love forced them to take the painful choice to be distant so she could have a life. The fiancé who had jilted her had contracted an inoperable genetic disease that only came to light during the required premarital medical check. Rather than take her through his painful death he chose to leave her at the altar. He also died shortly thereafter holding her picture and alone.

Each story was masterfully told, both showcasing what she thought happened and then repositioning it against a back story that directly contradicted Francine's memory. Rather than being abandoned and betrayed she had been so deeply loved that folks had sacrificed deeply for her.

This was Robert's skill turned up to 11. He understood how people worked and was able to craft believable stories based on actual facts that changed the perceptions around a known bad event. The reality behind the events was unknown, but reality no longer mattered. People believed the backstories; more important, Francine believed the back story.

However there was one rule in this competition and that was that everything had to be created; you weren't allowed to use real people. And Robert had violated that rule. Basically he had thrown what had to be the most important competition in his lifetime.

Francine's Reaction

You didn't have to wait long for Francine to react. Robert still stood next to her and she was clearly struggling with deep emotions. The struggle didn't last long and she reached from the floor to slap Robert hard enough to almost knock him off his feet. But then she did something really strange, something folks kept on talking about for months, she cupped his chin and kissed him deeply. Saying "If you ever pull something like this again I'll kill you but, for now, I'm deeply grateful. But, if you wanted to take me out, there were easier ways."

After that, Robert and Francine became an item and later got married. Some of their joint projects were award-winning comedies as Francine had discovered her sense of humor and Robert seemed to have a knack for helping her keep it. They never had children of their own but their Dreams

were their children, and these Dreams captured the imaginations of children around the world and they created worlds that could be enjoyed by adults and children alike.

As far as the award, well for the first time in history all three contestants were promoted. It turns out there was a loop hole in the rule surrounding using real people that was put in to allow a contestant to create a Dream as an homage to another Master. Masters were fair game.

It appears Robert had won twice.

●●●●●

Afterword

DreamWeaver anticipates the natural evolution of CGI and better mind machine interfaces to transform media into ever richer virtual worlds increasingly indistinguishable from reality. I hope it brings a way for folks to reform themselves and erase those aspects of their lives that cause ongoing pain and personal suffering, both for themselves and for loved ones. I hope it doesn't become a tool for either a more massive amount of crap as Huxley predicted in *Brave New World* or as the next-to-last step in mind control where our reality is altered to reflect a political or industry agenda.

●●●●●

Technology Behind the Story

The idea for the story came from a presentation by DreamWorks on a new rendering engine that would allow the animator to move and position their creations real-time rather than the more traditional frame by frame route. This is also consistent with the test Movie up on Amazon called "12 Princesses" which is a virtual storyboard with full dialog and music being

used as a teaser for a future movie by the same name, this storyboard/movie was largely created by one person. It seemed that taking the DreamWorks technology and applying it to a project like "12 Princesses" would create something new and, since DreamWorks is where I got the idea, I figured I'd call the result a Dream.

My belief is that in the next 20 years we should be able to create a photo-realistic movie without traditional animators but with people who have an enhanced skillset surrounding creating digital life. But, unlike with traditional movies, because you'd need to create the virtual worlds that these characters resided in, you could create multiple experiences at once. One for the more traditional observer and one where the participants could wander through and focus on parts of the world, or even interact with it, in areas outside of the camera view. For instance, actually sitting in the bar in "Star Wars" or running with the Wolves in "Twilight". Game interaction would be against characters who actually had more of a personality. This could be driven by a back-end like Watson working against a massive set of databases that the artist would select from as they created their story.

However, movies won't be the only thing that is changed. Imagine court room presentations where the prosecutor or the defense attorney can show the jury photo-realistic images that back up their arguments of what actually happened in a criminal trial. Or presentations by long dead CEOs, political figures or other past influencers who have long since passed. In the next few decades, lines will blur between what is real and what is virtual and our ability to tell the difference will be increasingly compromised

IMAGINING
THE
FUTURE AND
BUILDING
IT

AFTER SCIENCE

BY KARL SCHROEDER

"There isn't actually a law against it," said the policeman.

"Well, there should be!" Lenore Garrett glared at him.

She could tell by the little sigh he gave that he was just here to indulge her.

"It's a violation," she added, "of my home."

He looked around. They were sitting in the dining room, which was where things had finally gotten too much. The furniture was all heavy oak. A large table so deeply varnished it was almost black dominated the room and an equally massive credenza on the inner wall looked like it was there to help hold up the house. The large picture window opposite looked out on roses, and the neighbor's fence.

"You took the drapes down," he prompted.

"To wash them. That's when it happened. Look, you can see it!" She drew her finger along the dark surface of the table.

Normally when she did that, a trail of interface icons was left behind to slowly fade. The camera-projectors her nephew Allan had installed on the ceiling interpreted her gesture and could paint images and interfaces across any surface in the room.

She'd been doubtful at first. "Just pretend they're track lighting, Auntie," Allan had said when she complained about him drilling into the crown molding. And he'd been right, they'd made the house come alive. That was so important now, because Allan had died—her last living relative—and the house was all she had. But how to explain it to this bored beat cop who looked barely old enough to shave?

"There!" Instead of the wake of menu options and photo thumbnails that she usually saw when she caressed the old table, she just saw…well, she wasn't sure what. Dates. Newspaper clippings. Old black and white photos, only they weren't hers. "What is this stuff?"

"You'll have to ask him," said the cop. "Why don't we go do that."

As they stood up from the table, the walls around them shaded from their usual daytime blue-white to a kind of haunted rose color. The house was reading her mood. It had taken Lenore a while to learn what the colors meant; at first she'd tried to reason it through logically, but eventually she'd learned to go by instinct. By now, it was second nature.

The little laser projectors stuck up unobtrusively in the corners had turned the wallpaper from a backdrop to Lenore's loneliness, into a kaleidoscopic scrap-book of her life. Before he'd passed, Allan had loaded all the family archives into a server that…well, she'd misplaced it, but it was in some drawer somewhere around here. Now, on what would have been cold, silent mornings the house would wake her with bursts of color, the music her sons had enjoyed, and beautiful panoramas of natural scenes on the walls. When

she was happy, the place literally glowed, and sometimes you could catch glimpses of those old photos chasing each other along the baseboards. You could almost hear the place laughing.

They entered the kitchen and there was the little criminal, sitting contritely at the table on whose surface a projected history of meals and birthdays gone by usually drifted. Right now, the thing was displaying a jarring sequence of linoleum patterns from the 1950s.

"Here's what we're going to do, Edgar," said the policeman. "Mrs. Garrett is not going to lay vandalism charges because you are going to point your projectors away from her house. In turn, Mrs. Garrett will put up the drapes she took down, to prevent any more accidental overlaps of your interface with hers. Does that sound like a plan?"

"I don't want your experiments in my kitchen," she told Edgar.

Edgar sat stiffly, not looking at either of them. "They're not experiments," he said. "It's a movement. You wouldn't understand."

"Well, you're right about that." Just look at him! She remembered when he'd been four and had gotten locked out of his house. His folks were working in the garage but he hadn't known that. He'd run to the neighbor—her, Lenore—and she'd taken care of him until his mom and dad came looking. He'd been such a nice kid back then.

Now he wore ripped jeans and a black T-shirt with some sort of Japanese cartoon character on it. His lank dark hair was plastered across his forehead as if he wanted to hide his eyes with it.

"A movement?" She laughed sharply. "A movement to annoy your next-door neighbors?"

"No," he snapped, unexpectedly, "a movement to see things as they really are. The exact opposite of what you're doing."

"I don't think we need to do this," said the cop.

"What do you mean, 'what I'm doing'?" she demanded. When the policeman looked like he was going to intervene, she said, "No, I really want to hear this. What do you mean, Edgar Arkin?"

He glared at them defiantly. "I could explain it for the next six hours but you still wouldn't understand. It's important. You're using this stuff," he nodded up at the projectors, "to cover over the real things that are all around you, with…photos and shit." He dismissed her entire family history with a wave of the hand. "What we're doing is using the same tech to reveal those same objects—to make you notice them, you know, notice where you really are. The here and now. This." He rapped the tabletop. "Not to turn it all into a mirror for your own life story."

Lenore sputtered, wringing her hands, and that was when the cop ordered Edgar out of the house. "And turn off your damned projectors, or you will be charged," he told the teenager.

She thanked the officer and, after he left, the kitchen and dining room reverted to her control as Edgar moved the projectors he'd mounted under the eaves and along the top of his parents' fence.

Lenore flitted about, restoring the curtains, drawing her fingers along the wounded wallpaper, soothing the house. Its colors were all wrong; the rose was gone and jarring hues warred in the corners. When images moved along its surfaces, they did so in jittery fits and starts.

Things were no better the next day. Edgar's insult to her whole life preyed on her mind. A mirror of her life story? Well, what else could she wish for at her age and lonely as she was?

The house was wounded and she blamed Edgar.

●●●●●

The teapot was pulsing.

Lenore looked up from where she was reading Georgette Heyer on the settee. Ah, yes, it was eight o'clock. She usually had tea at this time of the evening, because she didn't sleep much anymore and if she wasn't sleeping, at least she could be alert.

"Thank you," she said to the house as she levered herself up and reached for the teapot. At her touch, it stopped pulsing but now displayed four little leaf shapes with labels under them: Darjeeling, Earl Grey, Chamomile, Peppermint… That's what was on her shelf now.

"Yes, I know, I know, I'm not getting senile," she said. The leaves swirled and disappeared. The house registered what she'd come to think of as amusement with a mauve sheen in the walls.

It was all done with cameras and tiny projectors, Allan had told her. They could track something like the teapot while it was moving, and cunningly wrap their projected images around its contours or corners. Then they could see where she touched those objects; if she pressed the projected image of a button, it would act like a button.

What had really wowed her at the time was an extra piece of magic Allan had called REVEL, which he said had been invented at Disney. When the teapot was sitting on certain surfaces, like the dining room table, you could actually

feel the things projected on it: buttons would be raised, might have a rougher texture. Those leaves would have felt like they were faintly embossed in the porcelain surface of the teapot.

She was used to all of that now, of course. What mattered weren't little details like those, but how things made you feel. The house made her feel like she belonged; and more, it made her feel wanted, something Edgar would never understand.

With these resentful musings in the back of her mind, she went into the kitchen to make the tea. She put the teapot down next to the sink and happened to glance out the window. Late summer light slanted between the trees, leaving pockets of purple shadow in the woods behind her back fence.

A fluorescent green bee ambled across this backdrop.

In seconds, Lenore was outside. "Edgar!"

There were four of the bees. They were only lit intermittently; it was obvious that Edgar's projectors were having trouble keeping an eyeline on them as they flitted here and there. One flew into the rose bushes and she could see the dappled trail of laser light that was trying to paint it. The bee disappeared and the projector stopped trying to paint it.

"Edgar, what are you doing?!"

Edgar's black-haired head popped above the fence. "It's okay," he said. "Bees tend to ignore the color green."

"But what are you doing?" She knew she was repeating herself, but couldn't think of what else to say.

His fingers wrapped the top of the fence on either side of his eyes; for a second he reminded her of that old war-time graffito: Kilroy was here. "I'm making

visible the invisible, to the invisible," he said. His mouth was hidden behind the fence, but there was a challenge in his eyes. "Look."

He pointed at the hydro wires that swayed past their shared back fenceline. These were shaded by the maples that overhung them; after a break for the alleyway, the trees took up again further back, this time making a solid wall where the park was.

The hydro wires had a tiny blue dotted line painted along their entire length. As she watched it began to fade from one end. "What's that?"

"Hilary just went by," Edgar said. "She's one of the four squirrels that live with us. Did you know there were four of them?"

She shook her head.

"You've never thought about it, have you?" Edgar said, accusingly.

"What do you mean?"

"You look out your back window and you see a squirrel. But you never wonder whether it's the same squirrel you saw out there yesterday, do you? Or whether it maybe was born and grew up in your back yard? That its whole life is right here, just like yours?"

She stood there for a long moment. Then she said, "I can't talk to you over the fence."

"Come on around, then." He went to open his back gate and she went through hers. As she stepped into the alley she realized that the trees in the park behind Edgar's house were sparkling. No, not exactly sparkling—but they were full of little flecks of light. Her eyes weren't that good anymore but she would have sworn that some of them were labels, like the ones that had been on her teapot earlier.

Teapot! She was still holding it. As she walked into Edgar's yard she held it up and said, "Don't I look the old fool."

Edgar looked at it and smiled. "Can I show you something?"

His manner was suddenly very gentle, as he held out his hand. Suspicious, Lenore gave him the pot. He set it on a wrought-iron table in the center of his parents' garden and pulled up two lawn chairs, offering one to her. They sat opposite one another, with the pot between them.

"Are you going to read my tea leaves?" she asked, with a reluctant smile. He laughed.

"No, but this is a good spot. It's right in the center of the projector field, plus I've got some good macro lenses… " He reached under the table and put some cigarette-pack-sized devices on the table, arraying them around the teapot. "Can I… ?" He made to open the pot.

She was puzzled. "It's empty."

"Okay." He took off the lid and put one of the little boxes inside the pot. "Now…" He traced his finger over the side of the teapot and, suddenly, little menus and glyphs appeared on it.

"Yes, yes, I have this at home," she said.

"But now, look." He pressed his thumb against the side of the pot. Next to where he was pressing, a little window appeared. In that…

"What is that?" She peered closely at the tiny picture, which appeared to be of a translucent landscape, like one of those desiccated river bottoms where the mud has cracked into geometric patterns. This one, though, was the same beautiful pearly green as the pot itself.

"You're looking at a one-hundred times magnification of the area under my thumb. Just photographed by these." He nodded at the little boxes. As he slid his thumb along the porcelain, the window moved with it, and its view seemed to fly along the top of the glazed landscape. "You can see all the traces of the manufacturing process in this. Since I've got the thing captured I can do an image search…" He pulled up a tiny keyboard on the side of the pot and tapped something. Seconds later a new window popped up. It was really tiny but full of type, so Edgar put his palm over it. When he took his hand away the window was in his palm. He walked over to the house and slapped his hand against the stucco, and the picture was transferred there. With a pinch and then a two-handed swoop, he enlarged it until it was two meters across.

"Manufactured in 2005 in Seoul, Korea, at the Shan Shui factory. Here's a picture of that." Lenore blinked at an image of the place where her pot had been made. "Says here the design is…wow, from the thirteenth century!"

He came and sat down across from her again, then framed the teapot dramatically with his hands. "Mrs. Garrett, meet…your teapot!"

Its little surface swirled with images of itself—or, at least, its many cousins. There were ink drawings from centuries past; links to treatises on the glazing process that resulted in that wonderful pale green that made its tall pumpkin-shape practically glow on a sunlit table. For a startled moment, it seemed to Lenore as if the pot were unreeling its own family history, the way the house revealed Lenore's to her.

"Lot 450," Edgar read from tiny letters on its side. "It says so, apparently…" he opened the lid and peered under it, "right here…"

"That's enough!" Lenore snatched the lid from him, then picked up the teapot. "Now who's erasing the poor thing? You're drowning it in pictures."

"Uh, I guess so. Doing this is tricky." He thought for a minute, gazing out back. "Can I show you something else?"

Suspicious as she was, Lenore was also acutely aware that she hadn't talked to any other person in days. And she'd often wondered, in the past few years, how Edgar had gotten on. So she followed as he passed through the gate again and into the fringe of the park.

"I've set up cameras and projectors all through here," he said, pointing upward.

"That sounds voyeuristic, if you don't mind my saying."

"Don't worry—they ignore people. They're looking for everything else." He pointed again, and she began to see the things he'd done.

Ghostly track-lines ran hither and thither: illuminated paw prints of animals, projected from somewhere up in the trees. Except that there were also lettered labels on the track-lines with names, like Bill and Donny. Edgar shrugged. "I named them—our other neighbors, you know? Naming's a human thing, but the system lets you do it even though it's meaningless to them."

Lenore turned around, then around again. Everywhere she looked there were traces, signs, spoor. The trees were labeled with their species name, estimated ages, and even which squirrels and crows lived in them. Lines stretched back and forth, showing relationships, territories that had been worked out by Edgar's servers as they watched the life of this little grove unfold.

"There's an essay by a German philosopher named Martin Heidegger," said Edgar. "It's all about tools—how when you're using a hammer, it disappears into its 'tool-ness'—you just perceive its function, not the hammer itself. Until it breaks, and then suddenly you're confronted with this particular piece of

wood and this particular piece of metal—all strange and new. It's only then that you meet this particular thing you've been spending your time with.

"In other words you can use technology to cover things up," he went on, "and that's normally all it does. But what if you designed a technology whose purpose was to create that moment of breakage, when the tool suddenly becomes this unique individual in your hands?"

He touched the bole of a tree, calling up its menu. "The movement doesn't have a name," he said absently, "though some of us call it The Rewilding. After centuries of thinking of ourselves as metaphysical subjects peering out into a world of objects, computing suddenly gives us the opportunity to take our place as objects in a world of objects."

"Edgar," said Lenore, "you are a very strange young man."

He seemed unfazed. "What I'm doing here is called thalience," he said. "They say it's what comes after science. After we learn how the world appears to us, the next logical step is to find out how the world appears to the world. So, thalience is when you build things that blur the line between object and subject. We can't step outside of what Quentin Meillassoux calls the Correlate: the subject-object duality of our existence. But maybe we can build things that can and that can report back about what they find."

He tapped the tree's menu again. "…Build things that aren't really people yet, but aren't just dumb matter anymore, either. They balance in a gray world right in between the two. Jane Bennett calls them deodands. We're inspired by her, and by the writings of Meillassoux, and Graham Harman, Brian Cantwell Smith, Timothy Morton and Ian Bogost. Instead of us investigating the natural world, we want to wake up that world, so that it can tell us what it is. See?" He pointed at the tracks.

"Those tracks are part of an interface my system is working out for the raccoons. It's not for you and me—we can't use it. I don't know exactly what the system and the raccoons are doing, but there's some sort of give and take happening. The crows are way better at it, they've worked out an interface to look for mice. It's not my code, most of it; it's all descended from those first iPad apps for cats…"

Now he shrugged. "Anyway, I don't expect you to get it. Just believe me when I say I'm not doing terrorism or anything."

"Edgar Arkin," she said severely, "you are doing philosophy!"

"Well, no, actually it's all this stuff that's doing it," he said, nodding up at the trees. "I'm just building the infrastructure."

Lenore couldn't help herself; she was smiling. "The young continue to amaze," she said. "You've grown up, Edgar. How did that happen while my back was turned?"

But he didn't smile back. Instead, he turned away. "I used to play in your yard," he said. "I remember coming over lots of times. I got locked out once, remember that? And you took me in…" She nodded, still smiling.

"And then Mr. Garrett died and you slipped into your house and never came out again."

The words hit her like a slap. Before she could react, Edgar said, "You curled into yourself like a snail in its shell. I watched it happen. And I couldn't do anything about it."

Tears had started in her eyes. "Edgar…you know, I don't have anyone anymore."

"But you have the whole world," he said with that annoyingly smug puzzlement that the young can summon so easily. "Don't you see that all this—"

"I was happy to talk to you again," she said quickly as she retreated to the edge of the laneway. And while he tried to explain, she kept retreating, to her gate, her backyard, and her house.

●●●●●

Inside, she sat down at the oak dining room table to have a good cry; but the tears wouldn't come. She'd become just like her grandmother, she decided; grandma had once told her, "Oh, I still feel things just as strongly now as I did when I was sixteen. The difference is, I don't necessarily act on those feelings anymore." She wasn't too old to feel upset at what Edgar had said; but tears wouldn't do any good at this point.

She was mad, but she couldn't say at whom: at Edgar, for intruding into her life so suddenly and shockingly; or at herself, because he was right: after they'd all died, one after another over just a few years, she had retreated into the house. She'd stopped being Edgar's kindly neighbor and, she supposed, had just become 'that old woman next door.'

The dining room walls swirled with concerned orange, and seeing that, she barked a short laugh. "I'll have none of that, now."

She rose and went to stroke the wall, murmuring to it. Edgar was wrong: the house had helped her and it really had been a companion of sorts, who'd reminded her of the richness and sweep of her own life. There was more than one way for a thing to be…more than a thing.

Still… She lowered her gaze to the teapot, which she'd set on the edge of the wood. She remembered the day she'd bought it, how it had looked so unlike

anything else in the store—a little nonconformist waving, as it were, from one of the shelves. You just had to pick it up for dinnertime conversation to veer away from whatever fascinating topic it was on and into "Oh, where did you get that?"

Over the years she'd stopped noticing the thing's original uniqueness; was it still there? Or was Edgar right, and had the pot entirely become a mirror?

She dried her eyes and picked it up. She turned it over, she raised it to the light. She held it at a wacky angle and, just for a moment, she couldn't tell what it was she was looking at. Something alien. Something new, something that wasn't a teapot but its own nameless thing.

Astonished, she put this new presence down on the tabletop. It became a teapot again—but provisionally this time. Burning just under its cracked green skin, the nonconformist was still ready to grin and wave.

"Well," she muttered with a grudging smile.

"Hello, you."

●●●●●

Afterword

I find technologists are simultaneously too modest about what they do, and not modest enough. Computers, and information processors in general, are not so different from the ordinary things around us as we like to suppose; after 25 years of studying computers, trying to find out what was unique about them, Brian Cantwell Smith, former Dean of Information Sciences at University of Toronto, concluded, "We will never have a theory of computing, I claim, because there is nothing there to have a theory of. Computers aren't

sufficiently special. They involve an interplay of meaning and mechanism—period. That's all there is to say."*

Yet, while obstinately refusing to be as special as we'd like them to be, computers possess a quality that we've been too modest to admit they have. In my first novel, *Ventus*, published in 2000, I invented the idea of "thalience" to describe this quality. It is, quite simply, that computers have the potential to let us step outside of ourselves and then look back in a way that philosophers have always denied was possible. After Kant argued persuasively, some 200 years ago, that we can never know what the world is like when we're not around, philosophy went into a decline. It's never recovered, while its upstart offspring, science, has had dazzling successes. Yet, what if we built devices that did philosophy? That weren't us, and weren't even like us, yet could stand outside our own limited perspectives, see what was there, and then report back? Suddenly, all the ancient imponderable questions would be back on the table again—only this time, with the prospect of real answers.

Recently, a new movement has begun in philosophy. It goes by various names, the two most common being Object Oriented Ontology, and Speculative Realism. Its practitioners are people like Quentin Meillassoux, Graham Harman, Jane Bennett, Levi Bryant, Ian Bogost and Timothy Morton. They're not asking exactly the same questions as I proposed under the name of thalience—but they're close. The ancient glacial cap of the philosophical is starting to move again, inch by inch. And what I'm saying, in this contribution to the Tomorrow Project, is that maybe, just maybe, that ancient discipline may finally have found a tool with which to meet its original promise of providing real answers to those questions—you know, those questions: about life, the universe, and everything.

*From "God, Approximately" http://www.ageofsignificance.org/people/bcsmith/papers/smith-godapprox4.html

The Technology

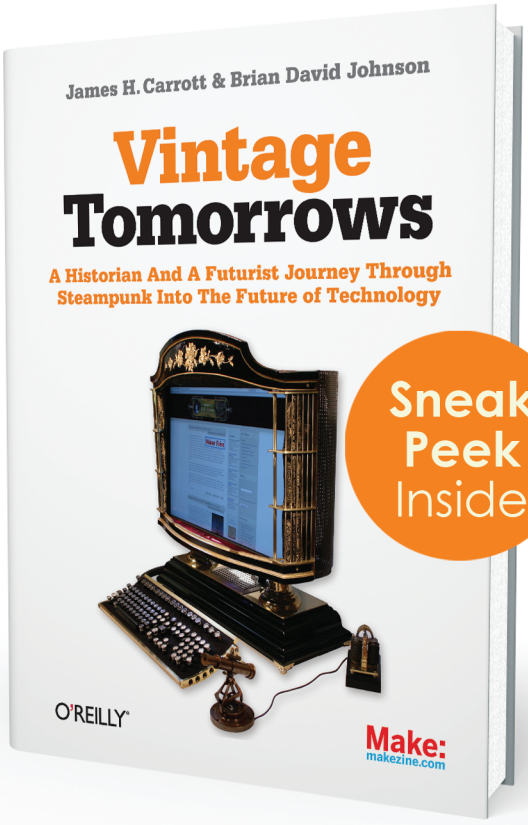
INTERACTIVE SURFACES, Douglas Carmean, Intel Labs. The unique algorithms in this technology make the interaction on any surface more accurate and precise. This means any surface in your home or work place could turn into a display that you can display on and interact with. In this demo we will show how our architecture enabled by Intel software will allow seamless integration of images from multiple sources and can wrap around corner surfaces in our home. Experiences like this will enable new abilities to share, interact with display objects in many new situation, locations and social/business contexts.

Sneak Peak: Chapter 1

Coming November 2012 from from MAKE and O'Reilly

In this fascinating book, futurist Brian David Johnson and cultural historian James Carrott offer insights into what Steampunk's alternative history says about our own world and its technological future.

Interviews with experts such as William Gibson, Cory Doctorow, Bruce Sterling, James Gleick, and Margaret Atwood explore how this vision of stylish craftsmen making fantastic and beautiful hand-tooled gadgets has become a cultural movement—and perhaps an important countercultural moment.



GET 50% OFF THE EBOOK VERSION

Enter the discount code AUTHD when ordering from http://shop.oreilly.com/product/0636920026631.do

Although it's not coming out until November 2012, you can begin reading the book now (and at half price): with Early Release ebooks, you get books in their earliest form — the author's raw and unedited content as he or she writes — so you can take advantage of these technologies long before the official release of these titles. You'll also receive updates when significant changes are made, new chapters as they're written, and the final ebook bundle.

Chapter 1

Vintage Tomorrows

It all began, like so many great ideas, over a beer. A futurist and a cultural historian have a pint in Seattle WA and start talking about the future and the past. They're both technologists, so the conversation inevitably leads to the topic of Steampunk.

The historian says that like the Beat Generation of the 50's and the "Hippie" counterculture of the 60's, he thinks that Steampunk is a sub-culture that is telling us something really interesting and important about what's happening in our mainstream culture today. Not only that, but it's telling us something specific about technology. If you wanted to join the Beat scene, you had to know North Beach; if you wanted to hang out with Hippies—whether tuning in, turning on, and/or dropping out—there was a song on the radio that told you to go San Francisco with a flower in your hair. But today if you want to find Steampunk you need only look online. Add all this to the fact that the world of Steampunk romps through a gadget-obsessed historical fantasy that values imagination above (nearly) all else and you've got something uniquely _now_, but wrapped up in the stuff of _then_.

Steampunks, along with maker culture, hacker groups, and any strange number of builder and creator networks are all tapping into the same thing: our relationship with our technology is changing. What's more, we're aware of it—and we're rooting around in the past to help us sort it all out.

So over that beer we asked ourselves: What can Steampunk teach us about the future? Why look backward in order to look forward?

...and spent the next few years traveling all over the world and talking to a wide range of people to get that answer. This is our story... what we learned and what it means for the future.

Seattle, WA

A Futurist and a Cultural Historian Walk into a Bar... We know it sounds like the beginning of a joke but that's pretty much how it happened. It was cold and raining in Seattle that night which was really no surprise for November in the Pacific Northwest. Brian was in town for a lecture he was giving at the University of Washington and James makes his home in Seattle. We met at The Pike Brewing Company on 1st Avenue down by the mega-tourist attraction: the Pike Place Market; it's the place where they throw the fish while tourists giggle and take lots of pictures on smartphones. On that night the tourists had all cleared out to avoid the weather. Worked for us. We were there for the beer. Pike makes a great India Pale Ale.

STEAMPUNK

As you can imagine we are going to do a lot of talking about Steampunk in the book (and also makers and hackers). Here's the quick run-down: Steampunk is a cultural movement that spreads across many mediums: fiction, gaming, fashion, and film. The easiest way to spot Steampunk is by the aesthetic; the way it looks. It's all about gears and goggles, Victorian costumes and massive machinery. Most people know it from the popular 1999 film Wild Wild West, starring Will Smith and Kevin Kline. Now Steampunk has a lot more going on than just top hats and gears—but if you can spot it that's the first step.

We got together for dinner just to catch up. The conversation moved lazily around until we started talking about Steampunk. We both were fans of the fiction but really hadn't spent much time thinking about it. We had been doing a lot of talking over the last few years about digital culture and the kinds of futures that might come about because of technological changes. Recently, James had made a connection between future his subculture research and Steampunk.

Now we should pause here. If you have just said to yourself, "Steam — what?" Don't worry. You are not alone. We're going to dive into the depths of Steampunk later in the book but for now let's say that Steampunk is a group of people that imagines what would have happened if we had information age technology in the Victorian Era. It's like a science fiction of the past. If you're thinking about the 1954 Disney adaptation of Twenty-Thousand Leagues Under the Sea or the 1960 Rod Taylor movie The Time Machine, you're essentially in the right space.

James took a sip of IPA and explained, "I've been mapping the cultural activity around Steampunk."

"You've been mapping the cultural activity about Steampunk," Brian replied, dead-pan, realizing that James had no clue how much of a culture geek he actually was.

"What?" James smiled. "It's what I do."

"Go on."

"OK," James continued. "If you think of Steampunk like a sub-culture, like the Beats in the 50's and the hippies in the 60's… If you look at Steampunk like the natural progression from the Beats, the Merry Pranksters, and so forth then something really interesting happens."

NOTE: James has a lot of background with the Beats and the Hippies. The guy knows his counter culture, he's interviewed and studied such

legends as Timothy Leary and Ken Keasy. He's spent over a decade exploring subcultures and their affect on wider popular culture. More on that in the next chapter.

"But for most people isn't Steampunk really about girls in little hats and guys in goggles?" Brian asked.

"It's more like a cultural movement," James replied. "It's not just fiction and comics but also music and fashion and art."

"It's still about girls in little hats and guys in…"

"I've starting working on a cultural heat map…"

"A cultural what?"

"Well, it's not actually technically a 'heat map' per se… "

Brian smiled and nodded his 'I'm humoring you but only for the next couple seconds' smile. Yes, he has a specific smile for that. "James," he said, "skip to the punchline."

NOTE: You'll see this happens a lot when James and Brian talk. A cultural historian and a futurist don't always speak the same language. We also like to interrupt each other. And give each other a hard time. Makes for and fun pint.

"It's kinda informal, but a cultural thermometer… "

"Now it's a thermometer." Brian's 'not _exactly_ sarcastic' tone.

"Whatever. The idea is to take in and map out all the cultural activity around a specific topic," James explained. "It could be a collection of activity around Steampunk or it could be about the Super Bowl, doesn't matter. Ideally you take all the cultural activity around the subject from media, fiction, art, fashion, movies, games, music… all of it."

"How much fashion activity do you really have around the Super Bowl?" Brian smiled.

"Jerseys, running shoes, whatever's in the coolest ad… "

WILD WILD WEST

When you talk to most people and they start to get an idea of what Steampunk is their memories usually take them to a film called Wild Wild West. This American movie was release in 1999. It was directed by Barry Sonnenfeld and starred Will Smith and Kevin Kline. The story was a western action-comedy that was based on the 1965-1969 TV series of the same name. It was a fun little film that was a popular but not a huge blockbuster.

What everyone remembers about Wild Wild West are the glorious steampunk gadgets. There's the villain Dr. Loveless' gigantic mechanical spider along with really fun nitroglycerine-powered penny-farthing bicycles, spring-loaded notebooks, bulletproof chainmail, flying machines, and steam tanks. For many the movie was the first taste of the Steampunk look along with it's whimsical sense of humor as well.

"Good point."

"If you take the cultural activity for Steampunk and plot it over time, you see this really interesting spike in activity starting around 2005 to 2007. There's this incredible rise in people creating Steampunk stuff."

Growth in Steampunk Cultural Activity from 1987 to 2011

"That is interesting," Brian finished his beer and searched for the bartender. "Why do you think that is?"

James smiled and pulled out his iPhone. "These things," he said, pointing at the smartphone. "Around 2005 these started coming to the market in mass. The iPhone came out in 2007. The Kindle, too. The following year came Android. All of these devices are changing our relationship with technology."

NOTE: The iPhone was really the world's introduction to the "smartphone". Before that phones were just phones. They were dumb. All most people did was make calls and send short text messages. When Apple released the iPhone in the U.S. on June 29, 2007 the world was introduced to an entirely new experience. The phone wasn't just a phone anymore it was now a computer and you could do some really awesome things with it.

Soon after a wave of little computers were announced and released. Amazon's Kindle followed on November 19, 2007 and Google released its alternative smartphone experience with Android in September 2008. How we as people lived and interacted with computers had changed forever. We now carried around powerful computers in our pockets.

James' Steampunk Thermometer shows a distinct rise in Steampunk cultural activity right around the same time that we witnesses a significant technology shift. There's more details about this later in the book but James was definitely onto something.

After ordering two more pints Brian asked, "OK. That's interesting. Why?"

"I'm not sure yet," James replied. "But what I find interesting is that I think it's all about technology. Steampunk is all about technology. It's not anti-technology… it loves technology.

"First off, it explores the implications of rapid technological change on history. They are imagining a different technological past. But what I think is really interesting is that Steampunk as a culture exists because of technology."

"What do you mean?"

"If you wanted to be a Beat in the 50s you had to go to North Beach," James said. "If you wanted to get in on the Summer of Love and be a Hippie, you had to go to the Haight-Ashbury. But today, if you want to be a Steampunk, all you have to do is go online."

"Wow." This is where Brian really started to get it.

"And it keeps growing," James took a sip of beer. "I think it's really telling us something about what's happening today in our broader culture. Just like the Beats and the Hippies, Steampunk is an indication that something is going on, something in changing in our broader culture and it's all about technology."

OK — THAT was a big deal. The next thing that happened changed both of our lives…

"So if Steampunk is changing the past," Brian asked. "If Steampunk is designing and imaging a different technological past then aren't they also making a very different request of the future? By playing with the past isn't Steampunk designing a new future?"

We were both silent. We drank our beer as the rain fell outside on the empty Pike Place Market.

"That's a really good question…," James said finally.

Jim: Possible Picture: Pike Place Market

To be truthful, after that pause we went on talking and the rest of the night played itself out in a fairly regular fashion when two geeks get together and talk over beer. At the end of the night James went home and Brian went to the Watertown Hotel and prepared for his lecture the next day. Life went on as normal. But the question didn't die…

If Steampunk is playing with then past aren't they making a different future? Why was this question so interesting?_

When we were talking at the Pike Bar we were sitting at an interesting point in time. It seemed like things were about to change and change radically. The way we were living with technology in our daily lives had changed pretty quickly all over the world. Technology had moved from the desktop to the laptop and then made its way into our pockets. It was projected that by 2015 there would be 15 billion devices across the world that could connect to the Internet or to each other. That's pretty amazing. 15 billion devices by 2015…that's more devices than there are people on the planet! And what will be on those devices? Data. Lots of data. Google's Eric

Schmidt had famously said that every two days we create as much information as we did from the dawn of civilization up until 2003.

It seemed like something was happening. Something was changing in how people used and interacted with computers and data. Steampunk seemed to be an area where these relationships and changes were playing out publicly and with grand flair.

Two days later…

Brian made the call to James.

Sound of cell phone ringing.

… and picking up: "James Carrott. Hello?"

"James? James H. Carrott, it's Brian David Johnson.."

"Brian David Johnson! Hey man. What's happening? Where are…"

"I'm in my car driving back from Seattle," Brian yelled into his hands free device clipped to the sun visor of his car. "Listen. We have to do a research project."

"What?"

"What can Steampunk teach us about the future? That's an awesome question. We need to do that! I don't know where or what it will tell us but we have to do it. I mean it. Steampunk! It's cool. We need to really look into what Steampunk can teach us about the future."

"Right on," James replied. "You know I'm in."

…and we were off and running.

From that night at the bar James and Brian traveled around the globe—yes, we literally went around the whole Earth—sometimes as a team but often solo. Starting in Seattle we jumped up and down the west coast from Portland Oregon to the big three in California: San Francisco, Los Angeles, and San Diego. Then we fanned out across the USA, to New York, and down to Florida. Then on to London, Ireland, France, Budapest, Hong Kong, Australia, and New Zealand… always chasing that elusive question: What can Steampunk teach us about the future?

This book is the story of that journey. We start by exploring Steampunk culture along with the maker movement and hacking communities. The first but if the book is filled with the people we talked to, the places and things we saw and what we learned. We've talked to experts and gathered stories from what we saw along the way. And yes, we really did learn something. We saw that Steampunk could teach us something significant about the future. People were hacking culture and history, not just hardware and software. They were playing out people's very different relationship with technology. But we didn't stop there. We asked: _So what does it mean? What do we build? What do we make?_

We learned that people really do want a different relationship with their technology. They don't see technology as a cold dead thing that is separate from us. When you grow up with a smartphone in your pocket, technology is a part of your everyday life. Your devices are a part of who you are as a person. Technology, if designed correctly, can make us more human.

We learned that people want their technology to have a sense of humor, a sense of history and most importantly a sense of humanity. It's so simple but the effects are radical. The last bit of the book is explores implications of what we learned. We sought out and talked with a whole new crop of experts who mostly knew very little about Steampunk and the subcultures we had investigated. Well… at least they didn't think they did. These gracious people were nice enough to listen to our story and tell us what they thought it meant and they even went so far as to tell us what they were seeing. The result? It was spooky. They were seeing and wrestling with the same issues we had teased out from out research. It showed all of us that we were on to something. Something was happening and it looked like a very different future than you might imagine.

Welcome to Vintage Tomorrows! Grab your goggles and your top hat, climb into the airship and let's get going. It's going to be one fantabulous ride!

More Info

Can you imagine what today's technology would have looked like in the Victorian Era? That's the world Steampunk envisions: a mad-inventor collection of 21st Century-inspired contraptions powered by stream and driven by gears. It's more than just a whimsical idea. In the past few years, the Steampunk genre has captivated makers, hackers, artists, designers, writers, and others throughout the world.

In this fascinating book, futurist Brian David Johnson and cultural historian James Carrott offer insights into what Steampunk's alternative history says about our own world and its technological future. Interviews with experts such as William Gibson, Cory Doctorow, Bruce Sterling, James Gleick, and Margaret Atwood explore how this vision of stylish craftsmen making fantastic and beautiful hand-tooled gadgets has become a cultural movement-and perhaps an important countercultural moment.

Although it's not coming out until November 2012, you can begin reading the book now (and at half price): with Early Release ebooks, you get books in their earliest form - the author's raw and unedited content as he or she writes - so you can take advantage of these technologies long before the official release of these titles. You'll also receive updates when significant changes are made, new chapters as they're written, and the final ebook bundle.

Get 50% off of the ebook version of this book by entering discount code **AUTHD** when you order the ebook from http://shop.oreilly.com/product/0636920026631.do

"Science and technology have progressed to the point where what we build is only constrained by the limits of our own imaginations." Justin Rattner, Intel CTO

What is your wildest request of the future?

What kind of future should we avoid?

What kind of future do you want to live in?

Brian David Johnson, Intel's Futurist, asks these questions of scientists and engineers, legends and luminaries, science fiction authors and recognized experts. This Tomorrow Project Anthology invites you to join the conversation and change the future.

THE TOMORROW PROJECT

Join the Conversation

www.tomorrow-projects.com

@IntelFuturist

Sneak Peek Inside

Coming November 2012
from O'Reilly Press