

2
0
0
3



**The Outer Limits
of
Actuarial Thoughts**

Actuarial Speculative Fiction

2003: The Outer Limits of Actuarial Thoughts

Version 5.0

Table of Contents

First Place:	
God's Actuary	by Alan Shulman
Second Place:	
Actuarial Certainty	by Gregory A Dreher
Best use of Computers:	
Antiquity in Their Midst	by Steve Mathys
Best use of Actuarial Science:	
Worth the Risk	by Joe Kincaid
Other Thoughts:	
Never Wrong	by Marnie Alexis Friedman
Jack	by Walt Herrington
Transformations	by Steve Konnath
Agua	by Richard O. Giberson
or	
How I Came to Bless the Name Carlos Eduardo da Silva Oliveira	
Simple Solution	by Zahra E. Zahid
A Mortality Study	by Sophia Dao
The Great Actuary and Underwriter	by Sarah L. M. Christiansen
1+1=0	by Jerry Tuttle
2051: A Mind Odyssey	by Beverly J. Orth
Force of Mortality	by Carol A. Marler
Large Scale Shifts	by Mark Horton
Lin's Story	by Sajid Zahid

God's Actuary

By Alan Shulman

The actuary sits at his desk staring blankly at a 3 inch thick mound of computer paper in a neatly folded pile that sits slightly askew on his keyboard. He exhales heavily yet with not quite enough energy to generate a sigh. It is early in the morning or at least it feels to him like morning as the oppressive weight of the work in front of him bespeaks the beginning of a long trek uphill. It is quiet save for the hum of the PCs and the ventilation system and whatever other remnants of white noise cling to the dregs of audible perception, remaining indistinguishable as individual sounds. The 94th floor is empty as it always seems to be lately, as if he were the first to arrive on a day when everyone else was off. There is a maze of cubicle walls that disguise the workday clutter strewn about the efficiently designed desks.

This stack must be the report he requested yesterday, or was it the day before, in a seemingly vain attempt to solve his problem. He was baffled by the results of his recent analyses and he felt compelled to explain the aberrant data. In fact, it felt like months, years, since he first noticed the spikes in the tables and he was unable to put this problem aside and get back to his regular work. Nothing in his past experience, no amount of sorting and grouping, no classifying or stratifying, no methods at his disposal shed light on the anomaly. How long has he been here? Minutes, hours, days? He cannot tell. When he thinks about it the answer seems to fade like the details of a dream, and he gives up as the process starts to become painful.

He thumbs aimlessly through the report on his desk, glancing at the numbers, but he is already subconsciously aware of the dead end this avenue of inquiry will turn out to be. The actuary stands, rolling the chair back on its wheels with the back of his knees and stretches his arms to each side, feeling a vague sense of relief from stress, if only for a few seconds. He glances down at the tiny clock on the lower right hand corner of his computer screen and sees that it's not even 9:00. Still, the need for a walk, maybe some coffee, compels him to head for the elevator.

The elevator door opens almost immediately after he presses the button. What a stroke of luck, he thinks, and hurries inside, not thinking long about the extraordinary event that has just taken place. He rides alone, the data still gnawing at his cortex like a termite. 'I've looked at gender, I've looked at age, place of residence, all sorts of risk factors. Yet there must be some explanation.' He is consumed with this thought. He can't put the work down until Factor X falls into his lap. For a while he was convinced there was something about the time of year, something about the late summer, early fall, that caused the blip. He hated thinking about human life in terms so trivial. Blips, anomalies, spikes, these were the words he and others like him used as tools for warding off death, keeping it at bay, not looking it square in the face. 'I use numbers like a carpenter uses nails', he thinks. 'The carpenter doesn't mourn the loss of a nail as he slams it permanently into place. The construction worker doesn't name all the rivets and

girders that go into a skyscraper like this one. No, nothing would ever get done if that were true. I'm doing a job', he insists, if only to himself. To put a human name, or worse face, to each integer would be to stare into an abyss. It would be like seeing through the floor of the elevator car and staring down at the never ending expanse of shaft beneath his feet. The mind reels at the sight and you lose your footing and plunge, floor after floor, to become one with the street below. No, the beauty of numbers he learned in middle school algebra was their abstract quality, their ability to be divorced from concrete and sometimes unpleasant reality and to exist on a plane independent of physical, mortal constraints. It was the mathematician's privilege to visit this ethereal realm, and to momentarily shake off the bounds of gravity, the limits of wealth and the strictures of society. The messiness of the real world, where people struggle for wealth and real estate in the great Darwinian Monopoly game, can be transcended and put into proper perspective. $A^2 + B^2$ always equals C^2 as far as triangles are concerned and all objects fall at 32 feet per second per second, from the smallest marble to the highest tower.

The actuary exits the elevator into an empty lobby. It is grand, though not in the way a gothic cathedral is grand but in the way the tall arching windows insinuate all that lies above. He strolls across the floor, the sound of his shoes echoing off the walls. The doors appear to be locked when he tries them but he can see the regular activity of lower Manhattan off beyond the plaza. This time he lets out an audible sigh, turns around and heads back upstairs.

When he returns to his cubicle, another thick report is sitting on his chair. He throws it on the floor and falls into his seat. His mind wanders. 'Why was I given this project in the first place? And who assigned to me? What is the enlightening piece of information whose inaccessibility has left me stranded in limbo? My job is to distill fact from fiction, to extrapolate a pattern from a cacophony of data. I am constantly in danger of the lure of false leads and phantom scents that distract the mind from concrete reality and direct it toward self-serving illusion. I question and I question and when I get answers I question their supposed foundation. It is very difficult to put aside and reject what seems patently obvious at first. Is this my desk? I can feel it. I am sitting in a chair on a floor in a building that soars into the clouds. Is it really here? Does it exist? My senses tell me so, they scream out in confirmation, but why do the questions keep coming?'

He moves quietly and hesitantly to the window. He looks out upon the majestic city with a feeling of wonder and dread. The sky is clear blue and there is a sense of peace about the island as if the buildings have fallen into place like a layer of fresh snow. Still he finds a chill in his spine and his stomach revolting and is forced to turn quickly away from the picturesque landscape and stagger back to his desk.

'Its like a natural catastrophe hit the city'. Even as he thinks this he rejects the notion as earthquakes and tornadoes know better than to approach the mighty metropolis. And if they had he would certainly know about it, wouldn't he? Yet it seems like the sort of mortality his data reveals can only be caused by an act of God. There is no precedent

in his experience for man-made death on this scale. 'Fires, industrial accidents, soccer riots, nothing even comes close. War, well that would certainly explain it but let's be serious here. This is Manhattan we're talking about, not some war torn country like Bosnia or Afghanistan.'

So checks and rechecks the data, waiting for the answer to leap from the PC like a horse and rider escaping the mouth of hell. In fact he is surrounded by answers, over his head, under his feet, and out of his window. The answers approach from unseen directions at dizzying speeds. They hold him in place and root him to the ground. He is in this place for a purpose, to search for answers. He will continue his search, God's actuary, seeking to explain the unexplainable, a mind struggling to know itself, sifting and sorting the data of the dead.

Actuarial Certainty

By Gregory A. Dreher, ASA, MAAA

gregory_dreher@conseco.com

“Dammit, Jim, I’m retired!”

A.J. Anderssen felt the strong urge to hang up the phone, but he knew he couldn’t hang up on his old boss, Jim Kudrow, the commissioner of insurance for the state of New York.

“It’s Ohio Security Assurance, A.J.,” Jim stated. “We are concerned about their current value annuity product, and we need you to investigate the validity of their pricing model.”

A.J. sighed. “Haven’t you investigated them several times already? I remember a couple of letters from the company, telling their policyholders not to worry about the investigations, that their annuity values would not be affected, and so on. I got these letters because I’m receiving annuity payments, because—and did I mention this?—I’m retired.”

“A.J., if there were anyone else I thought could get to the bottom of this, I’d send them. But it was you who broke Consolidated American’s preferred underwriting scam—no one else made that discovery. I’m telling you, A.J., I know in my gut that there is some kind of fraud in their product design. I want to hire you on a contract basis to investigate OSA.” Jim paused. “Money is no object,” he added.

“It’s not the money,” A.J. responded. “I’m trying to enjoy retired life with my wife. Even so, I’d be willing to do this job for you, but it’s a conflict of interest. I used to work with OSA CEO Jerry Faulk, you know. We attended the FAC together. I still send him a Christmas card every year.”

“I’m aware of your ties to Faulk,” Jim said. “In fact, I’ve already talked to him about sending you to investigate. He has no problem with it; in fact, he wholeheartedly approves of your coming. He respects the quality of your work and your impartialness.”

“All right,” A.J. finally responded, “I’ll do it. Just let me check with my wife and tie up some loose ends here.”

Two days later, A.J. boarded a puddle-jumper (“regional jet,” he corrected himself unconvincingly) out of Albany, and after a second flight, landed in Columbus.

* * * * *

“Good to see you again, A.J.,” Jerry said, shaking A.J.’s hand vigorously. A.J. remembered that Jerry was a year older than him, but he looked much younger, and showed no sign of slowing down with age. “Please, have a seat.”

A.J. settled into a comfortable leather seat, still feeling in his bones the effects of the previous day’s flights. “Good to see you, too. But we both know why I’m here, Jerry.”

Jerry crossed his hands, resting them on his desk. “Yes, I know. A.J., Ohio Security Assurance was founded in 2008 to provide basic, no-frills annuities to the retiring workers of the Baby Boom generation. The stock market drop of 2000 was fresh in people’s minds, mortality kept improving, and many retirees were afraid of outliving their savings. OSA filled that gap by focusing on the ignored retirees of smaller means.

We sold through direct marketing and used salaried home office employees, keeping our expenses low.

“As you know, I was the chief actuary, responsible for pricing our products. We priced our first products like other annuities on the market, with the then-current mortality tables and conservative mortality improvement. However, we soon learned that our experienced mortality rates were higher than expected. As a newer and smaller company, thus lower rated, we weren’t getting business from the wealthier annuitants, who as you know are generally healthier and live longer. But we did experience phenomenal growth in our target market.

“As a new company, we had top-of-the-line computer systems, and aggressively analyzed our collected data for our next generation products. As you remember from our actuarial exams, the ideal data source is company data, if credible. And despite the trend of higher mortality being evident in our credible accumulated data, the states firmly resisted our attempt to price our products with higher mortality. That’s what led to our pioneering the Assurance Plus current value annuity product. We priced two sets of annuity factors; one based on our experience and the other on market experience, and promised the higher payouts so long as our mortality experience justified it. And to properly monitor developing mortality experience, we require an annual physician’s checkup and fluid samples as a prerequisite to qualifying for the current payouts.”

A.J. nodded. “I know all of this, Jerry. I reviewed the previous analyses of your company, and I do own an Assurance Five Plus annuity. You also do genetic analysis, right?”

“Yes, we do,” Jerry replied matter-of-factly. “It’s an important part of data analysis. Our data mining programs analyze the genetic predilections of our clients in aggregate, helping us to examine prospectively whether or not our mortality assumptions will hold.”

“And they do?” A.J. asked.

“Correct. Despite the growth of the company, our mortality trends have been stable. Our market analysis shows that despite our growing number of annuitants in the upper end market, we have expanded the market as a whole, dominating the blue-collar and lower-middle-class segments. It has all balanced out overall.”

“Well, then, I’m eager to begin my investigation,” A.J. said. “I’ll need your pricing assumptions, access to your data sources, and a list of contacts to help me understand your systems.”

Jerry slid a data pad across his desk towards A.J. “Everything is there. I did my homework, too. After all, this is the *fourth* time I’ve had to explain these things.” Jerry leaned forward, over the desk, staring intently at A.J. “I want you and Mr. Kudrow to understand one thing.” Jerry spoke in a low volume, sounding more serious than A.J. had ever remembered him sounding. “I know several of our competitors in the annuity market have been donating heavily to certain New York state politicians. Two of these companies are not even licensed in New York. It is clear what they are trying to accomplish. I know you are an honest man and a fine actuary, but just like the ones who investigated previously, you will find nothing. There is *nothing* to find. And if Mr. Kudrow persists with his harassment, I promise a lawsuit unlike any the Department has ever seen.”

Jerry rose. “Now, let me introduce you to some of our fine workers,” he said cheerily, smiling as if the last exchange had never happened. A.J. rose, suddenly wishing he were back in Albany, puttering around in his garden.

* * * * *

A.J. spent the day meeting actuaries and IT staff, and familiarizing himself with the databases. By that evening, he had created a few programs to test the mortality experience. As Jerry had said, mortality came in as expected. He accessed the online database archiving the Transactions of the Society of Actuaries to refresh his memory about published studies of annuity mortality. Although mortality did not improve as much as pricing actuaries had expected when he started down the actuarial path, a slight improvement in mortality was confirmed in study after study. A quick search function applied to the articles confirmed A.J.’s suspicion: OSA had not contributed experience to any of the industry studies. A.J. tried to look at the mortality results again, but the numbers on the screen began to blur in his mind. He decided to tackle the project again after a good night’s sleep.

Before taking a refreshing and horribly overpriced continental breakfast in the hotel restaurant, A.J. checked and confirmed that his programs were working correctly. While chewing on his bagels, no inspiration struck him. He left breakfast knowing only that he must fall back on the actuary’s truism: when in doubt, analyze the data some more.

His morning was spent adjusting programs to slice the data into smaller pieces. As they ran, he examined the pricing cells used by OSA and filled in a few gaps that arose for some of his fine analyses. Once complete, he spent hours comparing actual results to expected. Again, there was nothing. Practically every product, every age band, every duration was coming in within a few percent of Ohio Security Assurance’s seemingly aggressive assumptions.

A.J. frowned. There he was, looking at small data amounts, and not seeing the normal level of variations. There should be cells with no deaths. With that many small cells, it should happen by chance, at least once or twice. Something had to be wrong with the data.

* * * * *

“Cincinnati Insurance Technologies.”

“Hello, could I please speak to Andrew Colacci, *FSA*?” A.J. asked, emphasizing the designation.

“A.J., is that you?” the voice responded.

“Yes, it is. Congratulations, Andrew!”

“Thanks, A.J.,” Andrew responded. “I’m glad I finished the exams before the SOA transitioned to the fewer, larger exams. I wasn’t holding out any hope that it was going to speed my travel time. What can I do for you?”

“I’ve been dragged out of retirement to do an investigation. I need someone with your computer skills to find out what’s hiding in some data that’s too good to be true. How about it? It sounds like a perfect job for your new consulting firm.”

“Come now, surely you’re overselling my abilities?” Andrew responded.

“Five years ago, I was ready to conclude that Consolidated American really was experiencing deteriorated mortality on its preferred UL block. Those quasi-AI data mining programs you created gathered data from every source imaginable and some I didn’t imagine, and based on health information, you concluded that the insureds were consistently being rated half a table better than they should have been. Had you not discovered this fact, we never would have discovered that the company had been falsifying underwriting results to the benefit of the insured’s rating, while all the while planning on raising COI charges when the true mortality results came in. I don’t think I’m overselling you at all.”

“A.J., I’d be happy to help you,” Andrew said, before quickly adding, “assuming, of course, that the state of New York meets my hourly fee.”

“I wouldn’t worry about that,” A.J. said confidently. “They should have no trouble paying for a proven consultant like you. I’ll zap over the standard confidentiality contracts, then a block of data. It’s annuity experience with a higher than expected mortality rate. Check to see that all these people are real, and their deaths are real.”

“Must be OSA,” Andrew quickly deduced.

* * * * *

The next day, A.J. returned to the offices of Ohio Security Assurance. His gut instinct was that the data supplied by OSA was accurate. However, there was one data set he hadn’t seen yet. He strode into the I.T. department, heading to the office of technology actuary Jennifer Wood.

“Welcome back, Mr. Anderssen. How can I help you?” she asked enthusiastically.

“I’d like to see the data from the Assurance Plus series underwriting and genetic testing.”

“But I thought we gave you a summary of the total risk factors,” she responded.

“Yes, you did,” A.J. replied. “But I’d like to see the underlying data.”

“Are you sure?” Jennifer asked. “The data is hardly user-friendly.”

“I’m a fast learner. Hit me with what you’ve got.”

Jennifer typed a few commands and passwords before calling up a table of values printed with font tiny enough to cause A.J.’s eyes to protest. Jennifer noticed his discomfort and set a larger font size.

“Okay,” she started, “each record is one data dump from our black boxes. The first columns are the sort data: attained age, duration, location by urban area or state, and the transaction year and month. The next columns are not going to be obvious; they refer to particular genes with impact on heart disease, cancer, and other such major causes of death. The codes are based on the Human Genome Project standards. There’s also data on telomere length.”

“I have some familiarity with the HGP standards; there have been several studies printed in the Transactions based on these data,” A.J. interrupted. “But telomere length hasn’t been shown to have a statistically significant impact on life expectancy.”

“Not yet,” Jennifer said. “But we’re studying the data right now. Maybe there will be a study based on our research in the Transactions five years from now. Even if not, there’s basically no cost to collecting the information.”

“Now, what were you saying about ‘black boxes?’”

“Oh, that’s just our name for the data collection devices we use. They’re black, they’re boxes, and by necessity, they obscure certain information,” Jennifer explained.

“Necessity?”

“Current privacy regulations don’t allow insurance companies to factor genetic predispositions into underwriting decisions. Although we don’t actually use this information in underwriting, we figure it’s best not to keep personal information attached to these records, just to be safe. If any annuitant wants to know this information, they can always use the services of a genetic counselor.”

A.J. tabbed through the fields on the screen, finally reaching the final column, a long string of numbers. “What’s that field for?” he asked.

“That’s a unique identifier randomly generated by the black boxes. It allows us to ensure that we don’t accidentally duplicate records.”

A.J. focused on the last column. “I’ll need access to this database,” he concluded.

Jennifer’s fingers flew over the keyboard. “Okay. You’re all set. Use user ID ‘nyinvest4’ and password ‘anderssen.’”

* * * * *

“You got anything, Andrew?”

“I think you’d better get over here,” Andrew replied.

A.J. set down the phone and hopped into his rental car.

Around two hours later, Andrew greeted A.J. at the door of his office building. He led A.J. to his office suite on the third floor, finally entering a large office. Andrew’s office featured half a dozen PCs, and eight flat-panel monitors showed data and partially written computer programs.

“What I found, I figured I could only explain in person,” Andrew started. He cleared papers off a chair next to the largest computer and took a seat in the chair in front of the computer. “I remember what Ohio Security Assurance always said to explain its higher mortality.”

“A greater proportion of lower-income annuitants?” A.J. queried.

“Exactly,” Andrew responded. “I took a list of names and locations of the deceased from the file you zapped me and set up some AI programs to gather information on the deceased. They analyzed key words in these sources: obituaries, mostly. I thought you’d want to see the results.”

A.J. looked through tables of occupations. He saw plenty of lawyers, doctors, accountants, professors... these weren’t the blue-collar workers he was expecting. He checked some marketing information from OSA on the datapad. They listed sales by income bracket and by economic market. “These deaths seem to be fairly even across classes,” he said. “How is OSA getting worse mortality than anyone in the industry?”

“I wish I knew,” Andrew replied.

“There’s something else I’d like you to look at,” A.J. said. “Let me do a remote login to one of OSA’s databases.”

“Use that computer over there,” Andrew said, motioning to one corner. “The others are running programs.”

A.J. wheeled his chair over to the computer, and accessed the OSA annuity underwriting database. Andrew looked over his shoulder. “See that long data string?” A.J. asked. “That’s supposed to be a random number generated by a computer device.”

Andrew grabbed the mouse and called up a computer program A.J. didn’t recognize. “Let’s find out,” Andrew said. Computer code of some kind filled the screen. Andrew executed the code and within a few seconds, statistical distributions filled the screen. “This program compares data to both a true uniform distribution and various numerical distributions commonly used by computer programs in their ‘random’ number generation. These numerical strings here do not correspond to any of them. They are also not representative of the distribution of the letters of the alphabet.”

“Then what are they?” A.J. asked.

“Possibly more data collected by the device?”

“Or information that they don’t want us to see?”

“A code?” Andrew suggested.

“It could be. Do you have a program that can look for relationships in these fields?”

“I’ll program one,” Andrew said, smiling.

“In the meantime, I have an idea,” A.J. said. “I’m scheduled to fly home for the weekend. I think it’s time for me to go in for my annual checkup.”

Andrew looked at him. “Why?”

“You’ll see.”

* * * * *

A.J. shook Dr. Larson’s hand. “I’m glad you could squeeze me in on a Saturday,” A.J. said. “I know I’m a little early for a checkup, but I’ll be traveling soon, and I wanted to make sure I’m up for it.”

“You, A.J.? You’ve always been the picture of health. I’m sure nothing’s wrong with you.”

“I hope so. Say, can you also handle my annual health reading for my annuity today?”

“No problem.” Dr. Larson buzzed a nurse and made a request. A short while later, she appeared with a small black box and a plastic envelope. Dr. Larson continued with the checkup, and once finished, he picked up the black box.

“You’re familiar with the procedure,” Dr. Larson said. A.J. nodded and rolled up his sleeve. Dr. Larson placed the box against A.J.’s upper arm. He pressed a red button, and a LED panel lit up on the box. A.J. winced slightly as a needle pricked his arm, soon followed by a small jolt of electricity. The box beeped, and Dr. Larson withdrew it.

A.J. looked curiously at the box. “Say, Doctor, can you tell me how that device works?”

Dr. Larson took the box to a computer terminal in the corner of the room. “Well, there’s the obvious function of drawing blood and testing blood cholesterol and body fat. It’s a handy device; it saves a little time in the checkup. I take the device to the computer—it plugs right in to the USB port—and upload the data.” Shortly after the box was plugged in, the computer automatically launched a Web site; the Ohio Security Assurance logo was prominently featured at the top of the page. “I then type in your name and policy number,” Dr. Larson said, while typing in the information. A task bar

appeared on the screen, which completed quickly. The computer beeped, and a message displayed on the screen: "Data successfully uploaded. Thank you for using Ohio Security Assurance for your later-life income protection needs."

"That's it?" A.J. said.

"Yes, that's all. If only all aspects of delivering health care were so simple."

"So, what happens to the box?" A.J. asked.

Dr. Larson sealed it in the plastic envelope. "It's disposed of with the medical waste." He buzzed for the nurse.

"Seems like a waste," A.J. commented.

"It's par for the course in medical care. And it's not like it's a complex device. It's probably mass-produced at three dollars a pop." The nurse arrived, and Dr. Larson passed her the envelope.

"Thank you again," A.J. concluded, shaking the doctor's hand. "I'll see you sometime, hopefully not soon!"

"Goodbye, A.J."

A.J. left the examining room, closing the door behind him. He glanced down the hall, and spied the nurse, busy chatting at the nurses' station. A cart with supplies and collected waste was at the side of the corridor. A.J. waited until no one was looking his way, then grabbed the envelope with the device. He hid the envelope under his coat, and left the building.

Once he arrived home, A.J. opened the envelope, eager to get a closer look at the device. His hopes fell. Instead of the black box, all that was in the envelope was a dark gray powder.

* * * * *

A.J. flew back to Columbus Monday morning, but immediately drove down to Cincinnati to meet with Andrew Colacci. Andrew greeted A.J. with an immediate question. "So, what's the reason you're so eager to see me?"

"Let's head up to your office and revisit that HGP database. I had my annual checkup on Saturday, and I want to find the results of my test."

Andrew smiled. "And since Saturday was the first of the month, there shouldn't be many records in the current month's data."

The two men entered Andrew's office. All the computers were turned on, although only one appeared to be running any kind of program. Sitting at the main computer, Andrew brought up the login screen for OSA's database, and A.J. typed in his user ID and password. Andrew spoke to himself as he programmed a simple query, isolating the current month's results. Still, the returned data filled the screen. "Quite a few records already," he commented.

"As far as I could tell, the data was uploaded from their black boxes almost instantaneously. Already, there's probably results from checkups this morning."

Andrew turned to expanding the query's selection categories. "Issue state New York, male, attained age..." He trailed off, looking at A.J., who replied. "It'd be listed as attained age 70, duration 4. Not that I'm 70 yet, mind you. And don't you forget it."

Andrew snickered. “Whatever you say, old man.” The query completed, isolating one record. “There I am!” A.J. said. He adjusted his glasses and looked at the suspect data string. “66888811771177228855886681647326831012494728.”

“Strange, those double numbers,” Andrew mused. “Yes, we know intellectually that it’s as likely as any other combination in a true random draw, but it definitely looks suspicious.”

A.J. stared at the screen as Andrew spoke, quietly pondering. Suddenly, he shot up. “That’s my name!” he exclaimed, jabbing the screen with his finger.

Andrew looked at the retired actuary, dumbfounded. “How do you know?”

“I’m not sure, but look at the patterns. 7711 followed by 7722, 8855 followed by 8866. My name has D followed by E, and R followed by S.”

“But those numbers increase by 11, not 1.” Andrew mentioned.

“What if they’re double letters?” A.J. responded.

“What double letters, A.J.?” Andrew asked.

“You know, take my full name....” A.J. stopped as he noticed the perplexed look on Andrew’s face. “Which you don’t remember, since about the only place you might have seen it is on my FSA and MAAA certificates. A.J. stands for Anders Jens, which is a name I’ve always hated, so I’ve used A.J. ever since I could talk. Put my first and last names together, and the first 6 letters are the same.”

“That’s 12 letters, and there’s 12 paired numbers,” Andrew noted. “Let’s see how often this pattern repeats.” Andrew’s hands flew over the keyboard again, defining a query on the full database. The query took less than two minutes to run, but the anticipation made it feel like two hours. Fourteen records appeared on the screen, and both Andrew and A.J. unconsciously leaned forward. The records were clearly the result of three different policies. The two actuaries focused on the four entries for A.J.’s policy.

```
66557788668866998822883381326297738112501795
66667799669977008833884483487001749211463726
66778800770077118844885582587114820210582787
66888811771177228855886681647326831012494728
```

The coded numbers on A.J.’s Assurance Five Plus policy shifted by 11 per four digits each time the duration increased by one, occasionally shifting by 1001 instead. With the records sorted, A.J. noticed the pattern. “That’s not 7788 to 7799 to 8800, it’s 78 to 79 to 80. It’s two numbers interlaced. The numbers are doubled because the first letters of my first and last name are the same.”

“So the first record is two 65’s for two A’s? I know that number! It’s ASCII.”

“As-kee?” A.J.’s brow furrowed.

“Some useless trivia I learned long ago. It’s an acronym for American Standard Code for Information Interchange: 256 standard characters, consisting of letters, numbers, and symbols. It was important in the early days of personal computers, before everything became graphics-based; that was the standard way to print letters from foreign alphabets, for example. It hasn’t been useful in decades, but this artifact has persisted on computers to this day. Back then, if you wanted a beta, you’d type Alt-225.” Andrew held down the left Alt key and typed 2-2-5 on the numeric keypad. A “ß” appeared on the screen. “And then Alt-065 was...” He typed the numbers, and a capital A was printed. “The other letters of the alphabet appear sequentially.”

A.J. quickly calculated the first entry. “AA, NN, DD, EE, RR, SS, S and... what’s 12?”

“That’s not a letter. It’s probably a randomly-generated null value.” Andrew examined the four records. “It doesn’t look like it increases by one either; it’s generated randomly each time.”

Andrew quickly programmed a conversion, and the numbers translates into the names Anders J. Anderssen, Michael F. Michaelson, and Daniella L. Danielswilso, quickly confirmed as Daniels-Wilson by a check of the coverage file.

“Let’s get names out of the death claims file, and you use your data-mining programs to find out how these annuitants died,” A.J. proposed. “Then we can see how it compares with the ‘secret’ data in this file.”

* * * * *

A.J. returned to Columbus, arriving a bit late for a planned afternoon meeting. He spent the rest of the day meeting with various officials at Ohio Security Assurance, securing remote logins for several other company systems. He mentioned to several people that he was finding results were coming in exactly as expected, eliciting neutral comments like “That’s good to hear.” No one seemed to react with any emotion: no relief, no surprise, no suspicion. OSA remained an enigma, and A.J. felt he was down to his last opportunity. It was all going to come down to Andrew’s computer programming skills.

A.J. was already on the interstate when the call arrived. “You’ve got to see this,” Andrew said.

“I’ll be there in thirty minutes,” A.J. responded.

Andrew was pacing back and forth in the lobby when A.J. hurried in. “I think we’ve discovered a new mortality risk factor,” Andrew said as the elevator rose. He led A.J. to one of the computers in his office, which displayed a list of causes of death and percentages. A.J. knew it was off on sight, but Andrew brought up the results of several industry and population studies to present a direct contrast. “So,” A.J. started, “OSA annuitants experience higher than expected incidences of stroke and heart attacks. And it looks consistent throughout products and ages.”

“But why?” Andrew asked.

A.J. thought to his early discovery. “OSA approved annuitants who were predisposed to these conditions, illegally using the genetic information uncovered in their unique underwriting process.”

“There’s only one way to be sure,” Andrew responded, already beginning a new query.

The two fell silent, leaving only the sound of clicking keyboard keys rising over the soft hum of the computers. A.J. quickly grew tired of watching Andrew work, and turned to read the last month’s issue of *The Actuary* on one of the spare computers. He had just finished reading the newsletter from three months previous when Andrew said, “Done.”

A.J. watched over Andrew’s shoulder as the task bar of the executing query crept across the screen. Several pages of results finally appeared. They viewed the results, not seeing what they were looking for. “It’s got to be here somewhere!” A.J. said, rapidly tapping the Page Down key.

“You know, A.J., OSA is not known for its high rejection rate. Let’s look elsewhere.”

A.J. leaned back in his chair, rubbing his temples. “I’ve examined all the systems, but I’ve found nothing.”

“Well, I haven’t seen everything you have. Tell me what other data sources are available.”

“I have access to the pricing programs; issue, coverage, and payment files; the underwriting system we’ve been looking at; accounting systems...”

“Want to see what OSA is hiding in their accounting systems?” Andrew asked, smirking.

“Don’t tell me you have another program set up to analyze the accounting system.”

“Oh, but I do.” Andrew called up another program as A.J. logged in to the OSA accounting system. “This one draws upon insurance accounting textbooks and my own experience to automatically divide the company’s accounting buckets into standard groups, using the same AI techniques. It will identify any non-standard entries.”

The program quickly split out a number of unusual entries. The actuaries were able to deduce where some of the entries belonged, leaving a handful of others. Among these, one attracted their attention, due to its size.

“OSA is paying a lot there, but what in the world is ‘X or Y enviro prefix?’” Andrew asked.

“I have no clue,” A.J. admitted. He stared away from the screen, his gaze wandering over to the computer screen with the SOA newsletter still displayed. A.J. looked at the cryptic crossword puzzle on the last page of the letter. “It can’t be,” he muttered.

“What?” Andrew asked.

“Gen-X, Gen-Y, and eco- is an environmental prefix. If the name of that accounting bucket were a clue in that puzzle, the answer would be ‘Geneco.’”

“Geneco? The pioneers in nanotechnology? What business would OSA have with them?” Andrew wondered.

“That black box,” A.J. answered. Looking at Andrew’s curious expression, he explained. “They collect their underwriting data with a small black box. I, um, ‘borrowed’ the one from my checkup for further examination, but when I went to look at it, it had turned into powder.”

“Items automatically disintegrating into component elements is a theoretical design possibility with nanotechnology. But I didn’t think anyone was doing that in practice yet.”

“It looks like I need to have a discussion with Mr. Faulk,” A.J. said seriously.

“And I need to do some ‘research’ on Geneco. With the ABCD in mind, I won’t say more.”

* * * * *

Ever since retiring, A.J. had been rising around dawn. With thoughts of his discoveries bouncing around his mind, he arose even earlier. Unable to rest, he left his hotel before sunrise. The offices of Ohio Security Assurance were dark and eerily quiet. Still, there were several lights on the top floor of the office building. A.J. was not surprised to find Jerry Faulk’s office among those occupied at that early hour.

Jerry smiled warmly and rose as A.J. strided into his office. “Ah, good to see you again. How goes your investigation?”

A.J. was struck by the artificial nature of Jerry’s greeting. He couldn’t see his own face, but he knew his glowering didn’t warrant a cheery tone in response. “I want to know about Geneco.” Uncharacteristically, A.J. was having difficulty controlling his emotions.

“They make a particular device we use to gather medical information for our Assurance Plus products.” Jerry looked perplexed. “What does this have to do with your investigation of our pricing?”

“If that were all, you wouldn’t be paying Geneco that many millions of dollars. With a little research, I discovered what a comparable device should cost. I’m a fair estimator of values, and when I’m off by a factor of 100, I know you’re concealing something.”

Jerry shook his head. “I’m afraid you’re mistaken.” Jerry turned around, gazing out the window. “I’ve said it before. There’s nothing for you to find. I hoped you’d see that too. What’s wrong with our pricing?”

A.J. wanted to see Jerry’s face. He was hiding something, and doing a poor job of concealing it. He started around the desk, only to have Jerry turn suddenly and face him. “There’s nothing for you to find,” Jerry repeated, staring intensely at A.J.

“But I’ve already found it! A black box driven by nanotechnology and higher mortality, all associated with two causes of death. The problem with your pricing is that you’re not basing pricing assumptions on expected experience, but setting experience to meet pricing assumptions!”

“A.J., I’ve known you for years. I respect your work. I respect *you*. But do you realize how... how preposterous this sounds?”

That serious tone still overlaid Jerry’s words. He certainly wasn’t shocked by the accusation.

“I’ve confirmed just what those black boxes really do. They don’t just monitor your health, they implant nanites that can destroy it! Jerry, how could you *kill* just to meet your pricing assumptions?”

“This is my company, A.J. I cannot see it fail. I will not give up this actuarial certainty.” Jerry leaned forward, his hands resting on the edge of his desk, one finger pressing a concealed button. “I was hoping it wouldn’t come to this. A tragic fire in Cincinnati, and now, the sudden death of a colleague. You should never have looked at Geneco.”

A.J. looked at Jerry in shock, trying to formulate a response. Jerry just stared past A.J., his intensity fading. His tone of voice changed, almost sounding wistful. “It’s a sad fact that despite decades of rapid progress in fighting heart disease, stress can still trigger a heart attack in an apparently healthy person.” A.J. started to speak, but felt an intense crushing pain in his chest. As the pain spread through A.J.’s body, Jerry gazed solemnly at him. As consciousness left him, A.J. thought he saw a tear fall from his onetime friend’s eye.

A.J. collapsed to the ground as the first light of dawn penetrated the window. Jerry bowed his head over his late friend. After a moment of silence, he consoled himself. “At least there was room in our Assurance Five Plus experience for another unanticipated death.”

Antiquity in Their Midst

Steve Mathys

The Comstock Museum of Natural and Technological History has long opened its doors to those seeking knowledge. From the earliest days of the eighteenth century, when dinosaurs and fossils were all the rage, through the times when geology was more than simply a passing fancy, to current days, when we sometimes feel overburdened with information; from common, humble beginnings to a sprawling, rambling complex which can take three days to see all of; from a hall which began, simply enough, as a place for viewing antiquity, to a network and display of the most up-to-date resources and systems, that is the Comstock Museum. Now housed mainly in three additions which dwarf the original red-brick and brown mortar building built by Julius Comstock himself in 1798, the Museum spans three-quarters of a square mile, with housing for thirty staff, fifteen security, and six groundskeepers, as well as space for visitors who will be traveling here from all over the world this year and the next.

It is in this Comstock Museum that we join our story. We shall soon see that we are not alone on our journey. Our main interest and focus will be on one man, Andrews Justin, seventh-great grandson of the late Julius himself. How mister Justin came to be at this place, that is not for us to tell, but for him. Let's see what's happening, shall we?

We find our hero this morning strolling, though not leisurely, through the back woods, near the sixth hole of the Comstock Municipal Golf Course which borders the south edge of the complex, on his regular morning walk. A brisk stroll such as this the white-haired, slender, leather-skinned Andrews partakes of every morning, except those on which it is raining or less than six degrees of Fahrenheit. Peculiar? Not really, he just doesn't like being wet or extremely cold. Our hero was quickly moving along the leisure

path, mentally reviewing his day's agenda. Nine o'clock, lead a tour for the eight-year-olds from Trenton. Eleven o'clock, lead a tour for the eight-year-olds from Brunswick. Two o'clock, lead a tour for the eight-year-olds from Sacramento. Four o'clock, lead a tour for the eight-year-olds from, well, *somewhere* in Missouri, he simply can't remember right now. No bother, he'll check when he returns to his room. He could check now, but doesn't wish to stop at the Terminal at the edge of the path.

You might think that would be boring, a day filled with four tours of second-lesson students, and nothing else. And you're probably right, if you're talking about you or me. But, remember, this is Andrews Justin we're talking about here, who happens to be one of the sanest, calmest, most straight-forward gentlemen you'll ever meet. And, he's at least seventy years old, so he has learned the patience necessary to deal with such a crowd and never let them get under his skin. Which is good, because sometimes their questions can get rather annoying. Despite the convenience the One-World Net has created, it hasn't done anything for curbing that pre-adolescent curiosity.

But I digress. We're not talking about you and me, here, we're talking about Mr. Andrews Justin, who, in a few minutes, will begin his nine o'clock tour.

The tour begins in the southwest corner of the grounds, at the upper-left end of the U-shaped buildings housing the Museum. It is here, in the oldest part of this conglomeration of architectural styles, themselves now a visible tour through the history of American Midwest taste and design, that Julius Comstock first broke ground, beginning his house, which would later become the cornerstone of the current sprawl. Let us hear from his last descendent, Andrews Justin.

"It was in this spot, where you and I are now standing, that Mister Julius Comstock first started construction. The old house he made had brick, and wood, and mortar, a farming plot out back, with a second story and a vegetable cellar, but those were added later. They were the first family to move to this area, but not the last. He and his wife lived there, with many pets and farm animals, and raised five children, all of

them lucky enough to reach adulthood.” A couple of *ooohs* from the crowd remind our hero again of the fascination that today’s youth continue to hold with the ancient practice of allowing a family to procreate at will. “Yes,” he laughs, “five children. And many families had even *more!*” This brings another round of amusement, and they begin to move off through the tour.

They pass through the first few additions to Julius’s first house, which themselves are not preserved for antiquity’s sake, but contain what might be now considered priceless relics of old technology. Remember, this is a museum of technological *and* natural history, and as the tech began here in the upper-left wing of the U, so it continues down that straight line and around the curve, these days pushing the barrier between the two halves back up the other edge, invading on the natural, with ever new displays, more showings of old, private collections, further advancements leaving more to dust and requiring more physical reality, not simply textbook or One-World Net Dataset. During our short sojourn, Andrews Justin and his this-day loyal followers have moved into the early years, stopping for brief discussions about primitive electrical technology, including telegraphs, telephones, transistors and radios, digital watches, and more such arcane fluff. The children are, as always, amused by the size and cumbersomeness of the earliest vacuum tubes, the clumsy workings of personal computers, and a comparison to modern-day prices of the things that used to be necessary in order to run the simplest program. They pick up old floppy disks, mouse pads, even a discarded hard drive, turning them over and crowding around, wondering at how they worked, what they did, how people ever understood *anything* when they didn’t have *all* the world’s data at their fingertips in an instant. It is a sight to behold, watching curious youth, and Andrews Justin simply waits at the side of the Touch-Feel-Taste room for a few minutes, taking it in.

As they move down the corridors, up a floor here, down a floor there, through a hallway and past a few closed doors marked *PRIVATE*, Andrews answers questions they have and have always had. *Why are these so big? When did they build this part of the*

museum? Why can't we go in there? He is used to such things, and knows, in his heart, that most of the information they need, or want, is always available for them, at the conspicuous Terminal at the end and middle of each hallway, continually connected to the One-World Net, at hand and in real time. Often, he imagined that knowledge didn't seem the same coming from a machine, and that they might just *like* it better coming from him, with a wink and a smile and a *You can't go in there today because you're too small, but try again tomorrow*. But, sometimes, he felt that maybe the children were just doing him a favor, allowing him to feel useful, worthy of their attention, worthy of their time; despite this, he liked it anyway.

Such is one of those days during which we currently find our hero, our center of our story, our *point of focus*. Let us listen in, then, as our champion begins to tell how he came to find himself here, so far removed from what he had set out to become and accomplish, through only a portion of the fault his own.

“Late in the twentieth century there was another revolution, this time in the size, scope, and use of such computers.” Sweeping an arm to the right, he points out a stack of black boxes, six or seven feet high, of metal or plastic, shaped like squished rectangles. “Each one of those devices you see there is called a *laptop computer*. They were the first step in the One-World Net revolution, or so it is thought. With laptop computers came the ability to travel and work at the same time, keeping much more important information in a much smaller system than ever before. This greater mobility led to more demand for connection while they were away, and such things as the Internet and the World Wide Web came into being. You might remember that, as nice as they were, they were only good enough if you were in one place, and connected through a phone line. Well,” and here he points at another stack of smaller devices, looking more like tablets than any computer at all, “the *handheld* began growing in popularity right around the turn of this century. And, in only a scant sixty years, we've come from such devices as used to be carried around by others to those which you all hold on the back of your hand, with that

little connection you have there.” A few look down at the Sens-Disks on their selves, but most are so used to them that they do not even bother. They still seem to be listening, and Andrews continues.

“The decreasing size of technology, though, wasn’t what really brought about the change, nor was it the increasing speed of computing. Yes, these were all well and good, and they allowed many people to do more things more quickly, but they never really changed *what* things people did with computers and *how* they did them. Until, that is, the idea of *parallel processing* was incorporated with unprecedented advancements in data storage, programming, and satellite technology.” We have arrived at a pivotal point in our story, for we shall see what was the essential element in unmaking our hero, from what he was, into what he is. From better than mediocre, to not, to nothing. Yet I still call him a hero. Why?

Andrews Justin has, in the past seventeen years of leading tours, managed to come to terms with the large black box they are now approaching, standing alone in the middle of a wide room on the top of the third floor at what would be the immediate bottom of the U of the Museum. Just as the One-World Net is the keystone in our informational mansion, so this black stand represents the keystone in the Comstock Museum. Mister Justin had a lot of soul-searching to do, and a lot of grief to dispel, over this invention, this one little revolution in the knowledge process, which so effectively revoked thirty years of a career he held and enjoyed. But revolutions are never little, are they? We speak of paradigm shifts, of monumental breaks with authority, and they are right. Revolutions are an upheaval, drastic and unexpected, unstoppable and immutable, that change things most and most dramatically, and, it seems, when we can least afford them to.

Andrews places his left hand atop the black Terminal box, looking ever-so-much like a simple arcade game, with its wide speakers and flat-screen display, and faces his audience again, a move he has performed four times a day, four days a week, forty-eight

weeks a year, for the past seventeen years, six months, two weeks, and three days, and will continue to perform, for the next two years, five months, and a day (not counting today), until the mandatory tour guide service period of twenty years is fulfilled. Not that he is counting down the days, but it seems that every time he does this, for he does it every time, another *tick* of something in his life goes by. Another moment he will never have again. Another breath closer to death, another step farther from birth and happiness. Still, I have neglected to tell you about the conflict in Mister Justin's soul. Again, it will be better when it comes from the man himself.

“Parallel processing and satellite connections meant that instead of just my computer working on a problem, *any* computer in the world could work on that same problem at the same time. The beauty of it is that if you have two computers working on one problem, they can get it solved much faster than any one computer can alone.”

Andrews presses his hands together and then splays them apart, making a tree out of his arms, branches of his fingers. “Then, when you put a lot of computers together, they *all* can work on *all* their problems at the same time. This means that there was so much power available, the innovators of the One-World Net could finally get down to some serious computer programming to take advantage of it.

“They began with a simple concept - to create a worldwide database holding all the information they could possibly store, and make it available to anyone who wanted it. Their goal included recording information, but also recording the *questions* asked in order to reduce duplication. And, since 2033 that data storage and recovery has been ever improving, thanks to the self-perpetuation of the One-World Net, one of the first Terminals of which is standing right here in front of you.” He smiles and pats the black hulk beside him. “And, this baby still works. A little slow, but anyone want to try?”

A few hands go up. He points to a medium-sized girl in the back, and she comes forward. “How much rainfall will there be in Orlando, Florida next Friday?” she asks at the box, certain that its thirty-year old voice recognition and query analyzer chips will

still function perfectly. Turning to our hero, she clarifies, “We’re going on vacation.” Andrews Justin smiles and nods, and waits for the answer. In a few seconds, probably less time than it took you to reach this point in our story, the Terminal has the answer.

“To answer your question, Tabitha Shores, there is a fifty percent chance of no rain. Seventy-five percent chance of less than one inch of rain. Ninety percent chance of less than two inches of rain. Have a good day.” Though the voice is not mechanical or metallic, it lacks something. It’s recorded, it’s manipulated by circuitry instead of tissue, it’s regulated by impersonal fluctuation of electricity instead of diaphragmal strength; it’s just not quite *right*. The newer models are much improved in this area.

The little girl looks up to Andrews and says the same thing, adding, “It’s not as fast as ours at home. And it’s not as friendly, neither.” Sinking back into the crowd, a couple of friends huddle around her, giggling at the antiquity in their midst.

Andrews Justin allows a few more tour-takers to ask questions, which are always responded to politely and efficiently, if not as quickly as they would have liked, but as fast as possible for a first-generation machine in a fourth-generation world. By no means exhausted of curiosity, but tired of this room, the second-lesson students gladly follow our hero into the next, where they will find more similar wonders, smaller versions, a display of the history of the Question Analysis Database, and a second tour guide to lead them through the natural history portion of the Museum. But we are not to leave. We are staying here for a moment.

Perhaps you noticed it, perhaps not. Young Tabitha was recognized by our Terminal, correctly, and she did not seem surprised at this at all. And why would she? Her entire life has been one where there are Terminals recognizing her in many ways, Sens-Disk, eye scan, or more, but this was one of the more primitive, analysis of voice pattern and data matching. For the One-World Net realized that this little girl had a question, and that she had been asking this same question of a Terminal at least once a day for the past week, and is now predicting that her frequency and urgency of questions

will intensify as next Friday approaches. Such is the beauty of the One-World Net. In a sense, it learned to learn, by recording and storing the *type* of questions asked, as well as the solution to the problem. If someone in England wanted to know how much barley was grown in Canada in 1952, the central processing unit of the Terminal questioned would search through linked databases until it came up with the answer. Then, the it would record, in its own data storage set available for other Terminals to access, that someone in Europe was searching for data regarding barley, that the search was performed for Canada, that the year in question was 1952. Perhaps, then, it would also notice that the same person had been searching for yields on wheat, soybeans, and corn from Canada in 1952 also. Through the genius of computer programming the Terminal was then able to assign a portion of its task priority to finding out all the information regarding *all* 1952 crop yields for Canada and marking these data pieces as related. When the next question regarding such things, like Canada in 1952 or wheat production declines in the 50s was asked, the One-World Net now not only had the answer, it had answers to *unasked, possible* questions.

The advantage came for the business industries, teaching centers, trade, government, civil life, social service, everywhere. No longer were companies bound to use only their own information. No longer did marketers have to wonder *Exactly* how *will this be received?* They could ask a question of the One-World Net, and get an answer, and then go deeper, and still deeper, and still deeper, until they could be certain the response suited them. No longer did charities have to wonder *why* giving had been slow during a particular month, or year, or day; they had the solution at their fingertips, how much was due to increased prices in supermarkets, how much was due to lack of jobs, how much was due to decline of the importance of giving to such an organization. No longer wonder whether detergent really *is* cheaper at the store down the street. Ask a question, receive an answer, set in motion the tidal wave of change which continues to sweep ancient capitalism under the rug in favor of fair price, as fairly determined by the

One-World Net. No longer did political leaders need to argue about the exact cost of a reform to a social program, a change in benefits or an increase in costs. Ask a question, get a highly probabilistic answer, eliminating lost time due to shouting matches over correctness, over ambiguity. No longer was the repetition of data analysis every year a wasteful process. Do it once, the Terminals recognize what you've done. Next year, the Terminal performs the same analysis, at the same time, collecting, collating, storing, sorting data, automatically, presenting you with precise answers ready for your evaluation. Make a change? The Terminal records that, too, and implements such in the future.

But why did Andrews Justin not have to explain all this history to those young eight year old students? Because the One-World Net is a part of their lives. As the steamship was part of the life of those born in the 1840s, as the motor car was simply a part of life of those born in the 1920s, as the radio and television were a part of life of those born in the 1980s, the One-World Net is simply a part of life of those who have lived since the 2040s. They live it, they breathe it in, they are a part of the One-World Net every day, from the moment they wake until the next moment they wake. The Terminals are tracking them, recording movement, action, question, answer, game, joke; metabolism, interactions, moods, emotions and stresses; temperature, wind speed, population density, wingbeats per minute of the butterflies in nearby fields, storing and analyzing data, all by the simple programming action of a few dozen hundred technologists who had an idea to create quick data analysis of large groups. They do not escape. They do not think to. It would be as much an upheaval to assert that society could exist in the 2060s without the One-World Net as it would be to say that society could exist in the 1960s without telephones, without automobiles, without lunchboxes.

Turn it off! you might say. *Such intrusion! Such a revocation of all that we humans are! We need our privacy! Were we not warned by prophetic novels of the twentieth century? Did we not learn anything from cold wars and communism? We need*

our independence. Turn it off! Turn it off? It cannot be turned off. The One-World Net has the power to turn on any plugged in computer, and as long as there is at least *one* in the world in such a state, the One-World Net will continue to run. Since the countless Terminals are indestructible, nuclear powered perpetual datasets in themselves, there will never be a shortage of computing possibility, data storage, and knowledge improvement.

But why would this have mattered Andrews Justin? Or did you forget that this tale was about him, and not about twenty-first century history? Let us join our little group again, let us catch up just as Andrews is ready to take his leave of these youngsters, in the common room at the lower end of the right-hand stroke of the U, where they will continue their exploration of the Comstock Museum with Bradley Hanson, their next tour guide. As always, this is the time for last questions. A tall boy in the back is asking one now.

“Mister Justin, have you always been a tour guide?”

Andrews thinks a second, then smiles. “Why, no, I’ve only been a tour guide for about seventeen years.” This seems to awe the audience, all except for the boy with the question. He has another, for his hand is again raised.

“Mister Justin, what did you do before that?”

“Well,” and he pauses, almost regretfully, before answering. “I was an actuary.”

“Oh, okay.”

This time it’s a different questioner, one of the other little girls on the side.

“Mister Justin, what’s an actuary?” Her teacher at the edge of the room smiles, knowing that this is a *good* question.

“An actuary is someone who used to do a lot of work before the One-World Net came into being. Eventually, not many people needed us anymore.”

Now the questions are coming from all around the room, faster than he or we can recognize quite who’s asking, and our hero is beginning to feel a bit cowed, almost like he’s going to crumble under pressure, but we’ll follow him as long as we can.

“Why not?”

“Because the One-World Net did all the things that we used to do.”

“Like what?”

“Like determining how much it would cost to buy insurance, or finding out what we thought people were going to do in the next few years.”

“Like fortune-telling?” This brought a few laughs, because everyone knew that fortune-tellers simply used an earpiece and a connection to the One-World Net.

“Well, not really, because we didn’t *know* what was going to happen. We tried to predict what *might*, and make suggestions on how to avoid problems in case certain things did develop. But, we were pretty limited in what we could do, being that we usually had lots less information, and if something didn’t work out like we thought it would, it took us a long time to analyze where we went wrong. With the One-World Net, the answers started coming quicker, and we weren’t needed so much anymore.”

Why not? Because they were now replaceable. Because they were now redundant. Because they were now behind the technology, and, although a few tried to adapt and use it for their own good, the vastness of the connections, the ease of replication, the scope of the data and the speed of analysis far outweighed anything the actuaries could do on their own to stop the progression. They fell into disuse, along with many others, like managers, engineers, some CEOs, certain decision-makers; even a few political alliances crumbled under the weight of such increasing utility. They were left behind, gone but not forgotten, because to be forgotten you have to be known in the first place, and those lost were never really known anyway.

“One last question,” says Andrews Justin, before he ushers them out of his care and into that of another. “Anyone?”

A response without a preceding hand rises from the crowd. “Are there any questions the One-World Net can’t answer?”

Our hero drops his head slightly, stretching a half-smile to one side, somewhat

remorsefully this time, as if he's considered the very possibility himself. In fact, that's what brought him here, to beg for a little nepotism to be thrown his way, after going mad. He'd wondered, and tried, and questioned, and asked so many things of the One-World Net, searching for something it didn't have an answer to, that he went mad with frustration before he was removed like the others. He asked, and the One-World Net answered. He asked again, and it answered. It always had an answer, and he never succeeded. Obsessed, he degenerated into a crumbled hulk, leaning on a Terminal in the cold, forgetting to eat, forgetting to bathe, forgetting family and friends before he was sent to a "safe house" for a year to recover, with a dozen or so others like him and no Terminals.

If it had failed, before he did, perhaps there would have been a place for him still, but, alas, no. Not until he'd been at the Museum five years had he felt the confidence to pick up an article on the subject and find himself face-to-face with what would have been the salvation of his sanity, had he only been able to think outside of his profession. He replies now with some "impossible questions" that have stuck in his mind for years, questions he's been too afraid to ask, questions that others may have, but perhaps have received no answer.

"Those questions the One-World Net cannot answer have nothing to do with this world. They are questions like 'Why did my mother fall in love with my father?' 'Why do I sometimes do the things I know I'm not supposed to do, and sometimes don't do the things I know I am?' You see? These are the questions that cannot be answered by the One-World Net, because it has no basis for them. It's outside the One-World Net's *sphere of influence*." He pauses, and looks sadly towards the ceiling, hoping that the little children won't see him beginning to tear up in the corner of one eye. "It's questions like 'Why did God make all those stars?' that the One-World Net can't answer." And, it's such a question that, had he known it years earlier, might have saved this simple, straightforward man quite a lot of frustration, heartache, pain, and emotional conflict.

For had he known that there *was* a question unanswerable, he might have just let it go. He might have just agreed that it could not answer, and that neither could he. He might have realized that there are things that are larger than us, no matter how much noise we make about ourselves. He might have realized all these things and been the better off, or he might have realized them and still made the same mistakes.

Perhaps this is why Andrews Justin is a hero. Not because he passed through hellfire and came out unscathed, nor even that he did not give up or give in. For he did. He gave up on his quest. He gave in to despair. What he did not do was give out. He grasped at his successes and missed, he tried and failed, and yet he is not bitter. He is beaten, defeated, crushed down and yet wears a smile. Take heart, you who struggle. Have faith, and you may be a hero, too, someday. All is not lost.

Worth the Risk

by Joe Kincaid

Kevin woke to the sound of his alarm. He sat up in bed and pulled his risk card from the alarm slot. A glance at the green indicator on the card confirmed what he already knew: the night's sleep was uneventful.

He slipped the card into the slot in the bathroom's card reader as he prepared for the day. The wireless connection between the reader and the shower controls started automatically recording the time he spent washing his body. He had to lift his toothbrush and his prescription bottles to the reader's magnetic sensor to register those. The card recorded, analyzed and processed his entire morning ritual. The green indicator blinked contentedly as Kevin finished getting dressed.

The card reader in the kitchen was located conveniently near the light switch. The refrigerator, the cabinets and the microwave sent and received signals from the card reader as long as the card was inserted. As Kevin assembled his breakfast, sensors detected his selections and sent the information to the risk card for processing. Instant oatmeal, canned pears and milk usually kept the card from complaining.

As Kevin sipped his coffee, he recalled the effort required to change his breakfast habits. He had learned if he brewed a second cup of coffee, it would be registered and transmitted to the risk card. The algorithms on the card might decide the second cup was harmful to his health. The indicator would then turn orange and his insurance rates would go up for a short time. It was better to avoid the second cup altogether. Low-risk behavior wasn't easy, but thanks to the technology in the risk card, he was able to monitor his habits and adapt accordingly.

Kevin looked at his watch. He hadn't moved this quickly in quite a while. How would the card react to that? He went into the den and placed the card into the master card reader connected to his desktop computer. The data automatically uploaded and he hurriedly checked the status of all his policies. Good, he hadn't moved too quickly after

all. Good thing, too, he chuckled to himself. When he had retired, he had promised himself he would never move too quickly again.

Kevin again looked at his watch. He might even be able to catch the 7:23 bus. He launched the day planner application and considered his options. The 7:23 bus would be crowded. That made it a high-risk and the card would certainly turn orange or even red during the bus ride. He would wait for the 7:58 bus. Fewer people rode that bus. James wasn't even expecting him until 9:30, so he could wait a half hour. He should wait a half hour.

Kevin went back into the kitchen, cleared the dishes and cleaned up. He now had half an hour to wait to catch the right bus. He sat at the dining room table to wait quietly with folded hands.



“Kevin! How are you?” James extended his hand in greeting to his old friend. The two became close friends almost immediately after starting in the company together twenty years ago. Now that Kevin was retired and James was Chief Actuary, their lives were following different paths, but they always got together every six months to upgrade Kevin's card.

“Green as ever, James. Good to see you. Is this going to be a major upgrade? You weren't too specific on the phone.” Kevin had used the last ten risk card models for at least two months before they were generally available to the public. At first, Kevin was just a convenient choice for James, but now Kevin's experience with new cards made him invaluable

“This one is just a software upgrade. We've put in a few new algorithms so you should notice that some behaviors have different colors. We want to test this upgrade fully before we go for the hardware again.”

“Still trying to reduce gaming?”

“The way some people try to manipulate the system is out and out fraud, Kevin, and you know it.” James' expression soured and his breathing became forced. His bio-monitor sent his rising pulse rate and blood pressure to his risk card and the glow on his desk changed from green to orange. James took deep breaths as he sat down and tried to

relax. The glow returned to green. “Besides, the last couple of rounds of upgrades have made it so gaming isn’t worth the effort anymore. No, this is simply a refinement of the risk classes. We’ve collected two more years of data since the last risk class refinement and it’s time to publish new ones.”

“Well, I’m all for new risk classes. Let’s get started.” Kevin took his risk card out of the mini-reader in his shirt and handed it to James who inserted the card into the transfer device. The device automatically copied the stored data from the old card to the new one and blinked when finished.

“Do you still have to lock up my old card for sixty days before destroying it?” Kevin always felt a bit of sadness each time he upgraded his risk card. “Or can you destroy it right away now? Why do you have to destroy it at all?”

James took his new card out of the transfer device and handed it to him. “We destroy the old cards to protect the personal information on the card. But we don’t have to lock them up anymore. We’ll just put this up on the shelf.”

Kevin looked at James quizzically. James just laughed.

“Don’t worry. There’s no danger of your private life getting out. The transfer device scrambles the data on the old card at the same time it writes the data to the new one. The card won’t work in any reader at all after that. If something goes wrong in the sixty-day trial period, the new card is required to unscramble the data so that you can go back to the old card. It’s very secure, I assure you.”

“Do you really need a full sixty days?”

“The sixty day period is required by law for each and every upgrade. No matter how good we think our technology is, there are always opportunities for human error. There have been isolated incidents reported of some unanticipated behavior combinations causing the card to show the wrong color and therefore charging the wrong rates. We don’t anticipate any problems, though. We have a lot more data for our models now and, besides, we’ve been testing and refining for several years. But, you never know.”

Kevin looked his card over inspecting both sides carefully. “The readout seems more polished. And I like the silver trim.”

“Our marketing department decided the cards would be more acceptable to the general public if we shined it up a little bit.” James shook his head. “I don’t think they

realize that not everyone wants to be told how risky their behavior is despite the premium savings they might see.”

“I don’t understand those people.” Kevin put the card away in his mini-reader and started for the door. “For me, I get to save money *and* know that I’ll live a long, healthy life. Why would I pass that up?”



Kevin entered the restaurant and walked over to where Susan was already sitting. He checked his card with a glance and eased into the chair across from her. “Have you been waiting long?”

“No, I just got here. Besides, I don’t mind waiting for you.” Susan’s eyes connected with Kevin’s and he blushed slightly. She could easily make Kevin’s pulse quicken despite being five years older than he was. Kevin pretended to find a thread on his sleeve as he stole a peek to see how orange his new card was turning. To his surprise, the glow was still a healthy green.

“Well, you shouldn’t have to wait at all,” he joked. “Not with all the waiters here to do it for you.” Susan smiled as if that were the first time he’d made that joke. Kevin smiled back, but inwardly he wondered why his new card was still green. He could tell she was having her usual effect on him even without the card.

“Have you thought any more about coming over tonight to play bridge? My sister’s out of town again and we need a fourth.” Susan’s hand walked across the table to meet his. “I made some snacks and Jeff’s bringing hot cider.”

“I’m still considering it.” Kevin didn’t like lying to her, but he wasn’t sure how to tell her ‘no.’ He went over to her place for bridge a couple of months ago and he had to admit it was a lot of fun. But when he got home and entered the game into his day planner, his card’s glow turned orange. Card games just aren’t very sanitary. He had become so upset by the indicator that he almost forgot to enter the snacks and drinks. Kevin shuddered at the memory of the red glow brought on by the shared bowl of snacks. He didn’t want to have to go through that again.

Susan pulled her hand back. “Is something wrong? I didn’t mean to upset you.”

Kevin snapped back to the present. He pulled his card out and looked at it expecting to see a deep red again. “I’m sorry, Susan, I didn’t mean...It’s just that...” He couldn’t find words. The card was still glowing green yet he could feel his heart racing. “I’m fine. Let’s order lunch.”

Kevin picked up the menu and slid his card into the side. His finger pressed one menu item and then another while the card changed colors in reaction to his choice. None of the colors would be recorded permanently until the waiter’s thumb print finalized his order. The Swiss mushroom cheeseburger with fries turned the card bright red. Choosing the garden salad turned it back to green. At least the food algorithms are still working, Kevin thought to himself.

Their meals came and they ate without bringing up the bridge game again. Susan finished her salmon. “Let’s order dessert. I haven’t had a good hot fudge sundae in too long.” She smiled devilishly at him as if they were teenagers about to jump into a fountain.

“Let me think about it.” He knew before he re-opened the menu that the card wouldn’t approve of sharing a hot fudge sundae. He went through the motions for her sake. She deserved to see his reasons for herself.

“Oh, it’s green! Let’s do it!” She waved to the waiter and ordered the sundae with two spoons while Kevin just sat staring. There was no other conclusion. The card was defective. He suddenly felt exposed and vulnerable. He had to go see James.



“I didn’t expect to see you back so soon. Did you leave something here?” James noticed his friend’s pallor and grew concerned. “Is something wrong?”

“The new card is defective. I want the old one back.” Kevin panted as he tried to catch his breath. He had raced here from the restaurant and was still trying to gather himself together.

“Defective? How? What are you talking about?” James frowned in puzzlement, but tried to maintain a reassuring tone for his Kevin’s sake.

“In the restaurant, it was green for a hot fudge sundae, a *shared* hot fudge sundae.”

“Is that all? Kevin, I have to tell you, the dietary algorithms are the most complex. Our bodies’ nutritional needs aren’t the same from day to day. Maybe you’d been low on calcium lately and the sundae would have filled in that need. It’s possible.”

“There’s more. I demand that you run a diagnostic on the card. You’ll see what I’m talking about.” Kevin was visibly agitated and his card was beginning to change color as he handed it to James.

“It seems to analyze your blood pressure and pulse just fine.” James placed the card into the diagnostic device. One by one, the tests executed and the results appeared on the display panel: OK.

“But it doesn’t register my pulse! That’s the problem! Look at the data on the card. You’ll see.”

“Kevin, I can’t. None of the card readers can reveal anything except the final premium amount to deduct from your account. Even that can only be accessed by the reader attached to your home computer.”

“But what about the diagnostic routines? They have to be able to read the data to know that the system is working right.”

“No, the diagnostic routines are based on the integrity constraints built into the database on your card and a full suite of test data to run the algorithms against. If any of the data is corrupted, the integrity constraints will pick it up. If any of the algorithms aren’t working, the test data will detect it. The system is about as self-contained as anything we’ve ever come up with. No, Kevin, if you want me to figure out what happened, you’re going to have to tell me the story yourself.”

“I was in *Foglio’s* with Susan and, well, you know I have a soft spot for her. The card didn’t pick up my increased heart rate at all. The last card would turn orange every time she and I had lunch together.”

“Now that is good news!” James laughed. “Kevin, the card is working just fine.”

“What are you talking about?”

“Part of the upgrade is sensitivity to the people around you. With the previous algorithms, all the card knew was that your metabolism had sped up. It didn’t know why. Was it flight? Fright? Or something else? They all had to be treated the same because there was no way to place your body’s reaction into context.”

“Context?”

“Having lunch with Susan, of course. She stopped by and picked up her upgrade just after you did. I thought you two would be a good test of the intercard sensitivity algorithms.”

“Are you saying that our cards are talking to each other? Doesn’t that break your privacy rule?”

“The cards share very limited information. The rule of thumb the legal department gave us is that the cards aren’t allowed to share any more information than I could deduce from a glance at you walking down the street. Even your age isn’t shared. Instead a very broad age range is passed back and forth.”

Kevin wasn’t quite satisfied. “I still don’t understand why the card was green when my pulse quickened in the restaurant.”

“The algorithms made a reasonable conjecture as to why your pulse quickened based on the context of the situation. You weren’t scared. You weren’t upset. You were just feeling like a schoolboy again. There’s nothing wrong with that. Susan is good for you, Kevin. There’s no reason why spending time with her should ever cause your card to go orange.”



Kevin did a lot of thinking on the bus ride home. This was going to take some getting used to, he knew. He opened his front door and heard his answering machine beeping in the bedroom.

“Kevin, this is Susan. I hope you’re feeling all right. Don’t forget about bridge tonight. We’d really love having you come over. If you’re not up to it, I understand. You seemed like you might be ill when you left *Foglio’s* this afternoon. If you are coming down with something, let me know. I’ll bring over some chicken soup. Give me a call. Bye.”

Kevin reached over and activated his phone. “Susan.”

She answered quickly. “Hello?”

“Hello, Susan. It’s Kevin.”

“Oh, I’m glad you called me back. I was worried. Are you feeling all right?”

“I’m not sure, but I would like to come over for bridge tonight. Do you still need a fourth?”

“Absolutely! That would be wonderful! Are you sure it’s a good idea, though? I mean, if you’re not feeling well?”

“I’ll be OK. Besides, I think it’s worth the risk.”

Never Wrong
by Marnie Alexis Friedman

“Again? Howie, no, really, I don’t think that’s right.”

“Of course it is, Miranda. It was a unanimous decision.”

“Howie, it’s been me for four years running. Surely there’s *one* other person at the company who’s made some bit of difference.”

“Everyone else’s job is pure rote, nowadays. Sure, some of the members of the actuarial team are still calculating weighted-average rates for ‘just-in-case’ scenarios, but that work has been entirely theoretical, because your model is never wrong. Face it – your work is the most significant thing this company – this *industry* – has ever seen.”

“But I didn’t *do* anything this year. The first year, sure, I guess I deserved it; that’s when I built the model. But since then, all I’ve done is tweak it a little, optimize things, automate a bit more. Nothing substantive.”

“Miranda, the decision is final. You *are* the 2021 Employee of the Year, whether you like it or not.”

* * *

“So...would you mind? He really wants to meet you – you’re like a rock star to him. He’s the only kid I know who said he wanted to be an actuary from the time he was six years old.”

She choked back a snort, remembering how actuarial work had been her last choice, a field she’d chosen only when it became clear that her ailing parents would need more monetary support than the meager stipend offered to graduate students. “Of course. I’d be delighted. Let me know what’s a convenient day.”

“Umm...well, he’s...he’s actually here right now,” Drew stammered.

She paused. “Well then, come on over. I’ve got a meeting in an hour, but nothing pressing til then.”

“Great! Thanks! Really, thanks.”

A few minutes later, Drew and his son appeared in the doorway of her office. She rose to greet them. “Hi, come on in, I’m Miranda Stayton.”

“Miranda, this is my son Andrew.”

“Andy,” corrected the young man. He shook her hand. “It’s, like, really great to meet you.”

“Thanks,” she answered, sitting down and gesturing to him to do the same. “I understand you’re majoring in actuarial studies?”

“Yeah,” he said. “Which pretty much means I’m majoring in ‘Miranda Stayton’s Amazing Model.’ Of course, it’s all proprietary so we can’t analyze it at all, but mostly we talk about how it’s changed everything for actuaries.”

She narrowed her eyes at him. “But you’re still covering the basics, right? Life Contingencies, Theory of Interest...”

“Oh, yeah, sure. But they told us we’ll only need it if we work for one of Duckrene Life’s competitors.” He laughed. “But your only competitors are the companies you don’t want to buy, right? So it’s, like, hardly worth learning.” He noticed her expression and anticipated the interruption she was about to make. “No, no, I’m totally learning it. Gotta pass the exams, right? But I mean, that’s all it’s for. I’m out in two years, and hopefully Duckrene’ll hire me straight outta school.”

She nodded, smiled briefly. “Good luck to you. You know we won’t hire actuarial students who haven’t demonstrated exam success. But we also won’t hire people without a firm understanding of the material on exams they’ve already passed. After all, we’re constantly refining the model. Can’t update mortality assumptions without understanding joint life probabilities, right?”

He grinned. “Alright, I’ll start paying better attention. But can I ask you one question?”

She restrained herself from pointing out that he already had. “Certainly.”

“I’ve been wondering about this a lot...Me and my friends have talked about it a little, but when we asked the professor he said he didn’t, like, waste time on impossible questions. But I was wondering...”

“Yes?” she prompted, knowing what would come next as he trailed off.

“Well...I was wondering, what happens if your model is ever wrong?”

“Andy!” Drew cut in angrily. “Her model is never wrong.” He glanced at Miranda apologetically. “Sorry...kids, you know?”

“But I’ve heard it was off by a few days a few different times!”

“Andy!”

“It’s alright, Drew,” she said. “Three times. Three times, the model has been off by one day.”

“Isn’t that, like, bad?” He was clearly nervous, but his relief upon asking the question that had been plaguing him was evident.

She smiled, reassuring him. “Having the model off by one day throws off my actual-to-expected ratios in the eighth or ninth decimal place. We only track six decimals. So no, I don’t think a few anomalous results are so bad. Mortality never used to be measured out to the day, anyway – that’s only been possible because the PIDs transmit a signal directly to our databases upon the death of their owners. You’ve heard of IBNR, claims ‘incurred but not reported,’ right?”

Andy nodded.

“But you’ve only heard that in the context of health claims. There are no more IBNR life insurance claims, because the Personal IDs report death as soon as it’s... ‘incurred.’ But Andy, to answer your question – if the model ever turns out to be wrong, we’ll fix it. That’s all. That’s why it’s so important to remember all the material from the exams – the only way to fix the model is to understand where it went wrong, and you can’t do that without a firm background in all the material.”

Andy nodded, apparently placated. Miranda could see him formulating another question, the logical follow-up, but then he glanced at his father and apparently thought better of it. “Thanks,” was all he said. “I don’t want to bother you too much, it was really nice meeting you.”

“Nice meeting you, too,” she said, standing up and shaking his hand again. “Good luck with your studies. I’ll look for your name on the pass lists.”

“Thanks again, Miranda,” said Drew, propelling his son out of the office.

Miranda sat down again at her desk, thinking of the three heart-stopping moments Andy’s question had recalled to the forefront of her memory. Betsy Coble, languishing in the cancer ward of a top-rated hospital, her 56-year-old body not quite as feeble as the model had projected it to be. Adrian White, lawyer by day, dare-devil motorcyclist by night, whose luck had held out longer than the model predicted. Nathan Reynolds, a nondescript man in a nondescript job whose life was notable only in that its length defied the model.

Each of them had caused her stomach to churn and her palms to sweat, had forced her home early with an excruciating migraine. And each died by the end of the day following the model’s projected date of death. Betsy had faded away painlessly as she slept. Adrian’s notorious lack of attention to detail in his nightlife meant that it came as no surprise that his brakes, the pads nearly worn away, had failed at a critical moment.

And Nathan was found in his nondescript bed, suffocated, presumably by a nondescript burglar who'd taken a nondescript television.

Miranda could hear Andy's unasked question: *What happens if you can't fix the model?* She pushed the disquieting question and the unsettling memories from her mind, then busied herself preparing for her meeting.

* * *

“Thanks, Tim. Glad to see Marketing’s on track for the new product roll-out. Alright, so that leaves...Actuarial. Miranda?”

“Things are on track. We’ve validated all the assumptions for the new product, and we’ll review actual-to-expecteds beginning one month after launch.”

There was a slight snicker at the word “assumptions,” and a larger one when she finished speaking.

“Great. And what are the actual-to-expecteds for the First Pioneer UL? It’s been a year since that launched.”

“Actual-to-expecteds are one, across the board.”

A few eye-rolls, one appreciative long, low whistle. “Your model’s dead-on even for mortality in the Moon colonies?”

“Of course, Chuck,” cut in Toni, a twenty-year company veteran. “The model is never wrong.”

“Yet,” corrected Miranda automatically. “But it could be, and that’s why we’re tracking actual experience.”

“Alright, thanks, Miranda.” Howie regained control of the meeting with the practiced aplomb of a COO. “Anything else?” His direct reports shook their heads, glancing around. “No? Alright, you’re dismissed. Don’t forget about the Employee of the Year dinner on Thursday.”

* * *

Returning to her office, she began writing her speech for the dinner. She looked over her speeches from previous years, and began with the same platitudes: “I’m so honored, I’m overwhelmed that the model has proven to be so useful to our company, I’m grateful to the members of my department who have improved the model in ways I would never have thought of on my own.” She wondered, briefly, if it sounded stilted always to refer to it as “the model.” On rare occasions, she called it “our model,” but she never, never

referred to it as “my model” in front of anyone in the insurance industry, or the media. She hardly used the phrase at all, in fact.

She outlined her speech, focusing, as she had the previous three years, on the value of teamwork and the importance of having a staff unafraid to criticize and correct. Writing somewhat by rote, she was jolted back to her senses when the computer gave a distinctive set of beeps. An alert message popped up on the screen, simply a number: “410136788.”

Toggling her screen over to the always-running terminal for the model, she entered the policy number, adjusting it with her own personal code of adding one to the first digit, two to the second, and so on.

```
Policy: 533582467
Owner: Burlock, Taylor, Mr.
Address1: 117 Cardinal Circle
Address2: n/a
Address3: Lilliorat, MA 02384
DOB: 11/17/1967
PDOD: 12/12/2021
ADOD: n/a
```

As she’d feared – well, known, based on the distinctive computer beeps – the policyholder’s projected date of death was yesterday, but he wasn’t actually dead yet.

A quick inquiry on the policy documents revealed that the not-yet-late Mr. Burlock was a senior executive at Pharm Phresh, a leading drug manufacturer. Miranda hurriedly Net-searched the company, and found that it was in the midst of a battle royale with its leading competitor; each company had accused its rival of corporate espionage. Dirty, underhanded tactics had been used so much in the long-ongoing fight that the NewsNet hardly bothered reporting on it anymore.

* * *

She buzzed her assistant, complained of a migraine, grabbed her purse and briefcase, and left the office. Stepping into her transport, she tapped the “Home” icon and let the craft propel itself through the mild, pre-rush hour traffic. Minutes later, she walked into her bedroom, took her anti-migraine medication, and hoisted a different black leather briefcase over her shoulder. As she got back in her transport, she switched to “Manual Entry Mode” and typed in the address she’d memorized from the computer screen.

In half an hour, she was approaching the front door of Taylor Burlock’s split-level house. She rang the bell, and a balding man opened the door momentarily, peering at her suspiciously. “Mr. Burlock?” she asked unnecessarily, having verified that he was recently estranged from his wife and lived alone.

“Yes?”

Even as he answered, she was opening the briefcase, closing her hand around the cold metal, pulling it out, aiming it directly between his eyes.

She whispered the words she'd only said aloud three times before.

“My model is never wrong.”

And squeezed the trigger.

Jack

By Walt Herrington

Mark was working on his actuarial model (and keeping an eye on the latest market returns) when an appointment reminder popped up. Was it 10:30 already? He pulled up his calendar. Yes it was, which meant he had to get ready for his presentation to his son's class for career day. Reluctantly he hibernated his open projects, then IMed the teacher notifying that he was ready for his presentation. The teacher, Mr. Klaussen, IMed in return, saying he would be connected as soon as the current presenter completed. Mark faced the holocam and waited.

After a few moments, the red "live" light on the holocam flashed. Mark could see a holo of the class in front of him (as they could see him). Mr. Klaussen told the class, "We are now pleased to welcome Steve's dad, Mr. Ysermann. He is an actuary for Megalopolis Life Insurance Company. Mr. Ysermann?"

Mark smiled and triggered the outline for his presentation. It appeared as a HUD (heads-up display) so he could continue eye contact as he made his presentation. "Hi, guys. How many of you are familiar with actuaries?" A few tentative hands were raised. "Good. Anyone want to tell us what an actuary is?" At that, the hands immediately shot down. Mark chuckled. "You know what an engineer is, don't you? Well, you can think of an actuary as an engineer who constructs – or builds – financial products, just like an engineer builds things like bridges or buildings." He had to keep his talk simple; the audience was a second grade class, after all. He continued, "Of course, actuaries do many different things, just like engineers do many different things. For example, my current projects have to do with detailed modeling."

"You mean you model things? Like clothes?" asked a kid on the front row.

Mark laughed. "No, not clothes. I mean I make complicated mathematical descriptions of things so we can see what happens. Have you ever noticed that some bridges have signs that say you can't cross them if your car or truck weighs over a certain amount, say, like 4,000 pounds?" The kids nodded. "OK. The engineer calculated that amount by making a model of the bridge, including all the information on what the bridge was made of, how long it was, and other things. Then he used that model to calculate how much weight the bridge could safely carry. I do something like that, only I do it with how financial things interact with other things like inflation, the stock market, the economy, and so forth. My model is very complicated and realistic. I've worked on it for several years." Mark could see the children start to squirm, so he hurried on. "Anyway, I do my work on computer, so I telecommute. That means that even though I work in Seattle, I actually stay home most days."

"What kind of computer?" asked a little girl. "We have a computer."

"Well, actually," Mark said, "I use a cerebro-computer package." One of the boys blurted out, "My mom's got one of those. She does things in her head, and sometimes she looks like she's talking to somebody when there's nobody there."

"Quiet, John," cautioned the teacher. "Don't interrupt Mr. Ysermann."

"That's actually a good description, John," Mark said. "I have a biotech link installed, and a small portion of my cerebellum is partitioned – that is, separated, and I run software on that portion, rather than on a computer. So when I do work, I don't punch a keyboard, write on a touch pad, or use a VI, er, a voice interface. I just, well, *imagine* the things in that special place, and I can write a computer program, send e-mail, watch RV, access the 'net – anything you can

do on any computer, except it's incredibly fast and realistic. For instance, I am talking to you now on my CC, or cerebro-computer."

"But isn't a CC dangerous?" asked Mr. Klaussen. "We run several security programs on our PCs, but occasionally a virus or Trojan horse slips by. It would seem like that would be incredibly dangerous, to get something like that in your own brain."

"I don't think there has ever been a successful CC virus. As you can imagine, the statutory – er, legal penalties for doing something like that are very severe. Besides, I run a firewall and do daily back-ups. And anyway, the worst that could happen is that the CC gets trashed, just like your computer gets trashed. Nothing would actually happen to me, or anything in my brain outside the CC area."

A lad in the corner spoke up. "My brother is really into CCs, and he says there is something that can do things to you. He called it Jack."

Mark shook his head. "I've never heard of anything like that, and I keep up-to-date on CCs. As far as I know, it's supposed to be impossible."

Mr. Klaussen stood up. "OK, class, we've taken up enough of Mr. Ysermann's time, so let's give him a hand to thank him." The kids clapped politely, and Steve flushed and squirmed. Mark said, "I was glad to do it. Goodbye."

The light on the holocam faded and Mark reactivated his open projects.

That afternoon he took a break, walking the trails in the neighborhood. The comment the boy had made about *Jack* intrigued him, so as he walked he made a search of the 'net on "Jack a virus that infects CCs." He got a number of hits. Most of the references were not germane to the topic. He was surprised to find some sites that did address the subject. Most concluded it was an urban legend, but one maintained that it was real. He check the site specs, and found it was several months old, woefully out of date by computing standards. Oh well, he told himself, that's about what I expected. He completed his walk and returned to work.

The next day he was working when he was paged visual with a priority one. He checked the page. It was from a Juanita de Sica. The name seemed familiar, though Mark couldn't place it, and it had passed all the spam filters. He accepted the page, and Juanita appeared in front of him.

"Thank you for taking my page, Mr. Ysermann," Juanita said.

"My pleasure. What can I do for you?"

"I am a columnist for "CC Today"," she explained. Mark snapped his fingers. Of course! That was why the name seemed familiar. "I am working on a story that I was hoping you could help me with," she continued.

"I often read your columns," Mark said. "They are very cogent. What can I do? I'm a novice in CCs, at least compared to you, Ms. de Sica."

Juanita laughed. "Call me Nita, Mr. Ysermann. And thank you for your kind words. What I actually am interested in, Mark, is a CC virus that has been called Jack."

"Jack!" Mark said. "Why are you asking me? I haven't written or published anything on the subject. And as I said, I'm no expert on CCs or other computers."

“Don’t be modest,” Nita admonished. “I’ve spoken to a mutual friend about you – Greg Jaines of Symantec. He tells me you’re a alpha tester for B-Lock.”

“You caught me, Nita. Ok, so I do know something about CCs, but I don’t know anything about Jack.”

“Yet you did a search of the ‘net yesterday on the subject, Mark.”

Mark sat up, startled. “How... It’s supposed to be impossible to trace searches.”

“We both know that very little is impossible when it comes to computers, Mark. I can tell you’re not a hacker or a bracker. It takes some doing but you can track searches down, as long as it’s done real time. As it turns out, I had a bot set up to log whenever anyone searched for information on Jack, as you did yesterday. So, why did you search on that?”

Mark explained what had happened. “So you see,” he finished, “I really don’t know anything about Jack. But, since you brought up the subject, what is Jack? Isn’t it just an urban legend?”

Nita shook her head. “No. I think that there is something there, though I’m not sure what. I’ve only been looking into it for a few days. My sources tell me it is a virus, but it is more than that. It is supposed to affect more than the CC. It’s said to actually get inside your brain, control you somehow. Most of the information I’ve gotten has come from Simon Welles. Do you know him?”

“The name sounds familiar.” He ran a quick search on the ‘net while he replied. “Yes, here he is. That’s strange. It says he is a former “CC Today” columnist and a Luddite.”

“Simon is a strange bird. He at one time was a leading authority on computers, and CCs in particular, but over the past year he, well, hasn’t exactly turned his back on tech, but seems to regard it as dangerous. He de-activated his biotech link, and doesn’t even have a broadband connection to the ‘net anymore. Anyway, he’s got a bee in his bonnet about Jack, and has gotten me interested as well. So I’m researching the idea with a view to doing a story eventually. Simon’s really the guru on the subject.”

“I see. Well, like I said, I really don’t know anything. But if I do find out I’ll be glad to let you know.”

“Thank you for your time, Mark.”

“My pleasure, Nita. It’s nice to meet the person behind the columns. Maybe we could meet sometime – have coffee or eat somewhere.”

Nita smiled. “I think I’d like that. Why don’t you call me.”

“I will.” Mark signed off, but instead of returning to work, he checked out Nita – as she no doubt was checking on him. The obvious place to start was her website, which he found with no problem. Nita de Sica – columnist for “CC Today,” thirty-one, BS from CCSF, several jobs with CC companies before she started writing her column. On the personal side, she had had one five year marriage contract, not renewed, as had Mark, and no kids. Talking with Nita had reminded Mark that lately he had been concentrating on work and had not gotten out much. All work and no play makes Jack a dull boy, Mark reminded himself, laughing to himself at the coincidental reference to Jack. Out of curiosity he checked his calendar, and was startled to find that it had been over 6 months since he had been on a date. Has it really been that long? He wondered. Let’s see, Mark thought, and he made a restaurant reservation and then started checking out the plays in the Seattle area.

Just then he got another page. This page was unusual in that it was for a phone call. Mark pulled up the caller ID. It showed the owner as unlisted. Mark frowned to himself as he accepted the call.

“Hello, Mr. Ysermann?” came a voice with no accompanying hologram. Mark found it disconcerting to talk to someone without the holo; even when someone had to kill the live holo on a call (say for privacy reasons), it was generally replaced by a still holo.

“Yes, this is Mark Ysermann,” he answered.

The voice chuckled. “Thanks for taking my call, Mr. Ysermann. My name is Simon Welles. I’ll get to the point. I’ve just spoken with Nita de Sica, and she says you’ve been searching for info on Jack.”

“Yes. It’s a bit alarming that someone was able to trace my searches.”

“And you have reason to be alarmed. Mr. Ysermann, I believe that Jack poses a very real threat, and anyone who investigates Jack is in considerable danger.”

Mark paused. “I find that hard to believe,” he replied finally.

“Believe it. I trust your firewalls and other protection are current.”

“Yes, but...”

“No buts. Do not take e-mail from anyone, even someone you know, until you have hosed it completely, and I mean completely. And even then, open it with a simple text editor with no hooks to anything else, especially the ‘net. Do you understand?”

Mark was bewildered. “Of course. I always hose mail. But if it’s from someone I know...”

“*Especially* if it’s from someone you know. And be very careful what you download. Well, Mr. Ysermann, I just wanted to warn you. Goodbye.”

“Thank you,” Mark replied, nettled by the litany of commands from a stranger, and broke the connection. He pondered the matter off and on the rest of the afternoon, eventually deciding that Simon Welles was a nut. He had to be. Why else would he turn into a Luddite?

He returned to work.

That night he had a particularly vivid dream. He dreamt he was home when he heard someone at his front door. As he watched, the knob turned, even though he remembered locking it. However, the dead bolt remained locked, and the door refused to open. He was very frightened. As he watched, the knob was tried several more times. Finally he moved on to other dreams, sleeping fitfully, and woke up in the morning exhausted.

The memory of the dream bothered him the next day as he worked on refining his model. He finally took a break and paged Nita.

“Hi, Mark,” Nita said. “Have you got anything on Jack?”

“No,” he shook his head. “But I got an unusual call yesterday from Simon Welles.”

“I talked to him yesterday after I talked to you. I hope you don’t mind, but I mentioned your name.”

“No, that’s OK. But he was very abrupt, almost frightening, warning me that it was dangerous to even search the net about Jack.”

“I should have warned you,” Nita said. “I’m sorry. Simon can be unnerving. He is a very dedicated individual.”

“Anyway, I don’t know if it’s connected, but I had this strange dream last night.”

“Dream? What kind of dream?”

“I dreamed I was at home and someone was trying to break in. They could open the door locks, but couldn’t get past the deadbolts. I was scared. It was like I was a kid again and the bogey-man was about to get me.”

Nita considered him. “So you think there is some connection?”

“I don’t know. I thought maybe it was my dreaming self’s interpretation of someone trying to get past my B-Lock firewall. But when I checked the log file it showed no attacks.”

“Interesting,” Nita commented. “So, do you think you were attacked by this Jack, or was it a nightmare brought on by Simon’s call?”

“I don’t know. I wanted to call you to see if you had had any similar experiences.”

Nita shook her head. “No.”

“What kind of firewall do you run?”

“That’s information we’re not supposed to give out, for several reasons. Being a published columnist on CCs makes you a target of every bracker around, so we have several layers of security – multiple layers of hardware security as well as software security. It’s too small for you to notice, but every bit is delayed several microseconds by the security as it passes to and from me. So don’t worry about me. I feel safe.”

Mark smiled. “And what does Simon say about that?”

Nita rolled her eyes. “He read me the riot act too. Anyway, what you’ve told me is interesting. I think I’ll chase Jack from that aspect.” She started to say goodbye, but Mark asked, “Nita – before you go, have you found out anything else about what Jack does, more than you said yesterday?”

“Well, it’s supposed to control you. You don’t turn into a zombie, but your interests change. As best as I can tell from what Simon has told me, and what other info I can get, you become like a cell of a super organism, with the purpose of furthering that organism. It’s a little nebulous, but it doesn’t sound nice.”

“How can it do that? How can it break out of the CC partition?”

Nita shook her head. “I don’t know. Anyway, thanks for the info, Mark.”

“How about dinner this Saturday evening?”

“Sure. I’d love to.”

Mark smiled. “Good. What if we meet at Ruchi’s at seven?”

Nita laughed. “You’ve checked my website, since you know my favorite food is Indian.”

“And I bet you’ve checked mine as well.”

“You are correct, Mr. Actuary. Have a nice day, and I’ll see you Saturday night.” And she signed off.

Mark continued to mull over what he had learned about Jack. Was there something there or not? Was it worthwhile for him to research it? Nita had more resources and expertise than he had. If she couldn’t find anything, what made him think he could?

An idea occurred to him. He paged Greg Jaines at Symantec. Greg had told Nita that Mark was an alpha tester for B-Lock, but Mark was actually more than that. Mark was an accomplished multidimensional 8G programmer. He had the source code for B-Lock and had tinkered with it himself quite a bit, so that his installation was different from the current alpha. That may have been what saved him, if Jack had tried to bypass the firewall via a back door.

Greg answered. "Hi, Mark. How's tricks in the actuarial world?"

"Great," Mark answered. "I have a question for you."

"Shoot."

"Look, I know what the official answer will be, but unofficially – does B-Lock have a back door?"

Greg hesitated. Mark added, "You know I have the source code. I could chase it down but it would take longer than I want. So tell me."

Greg looked around him and lowered his voice. "Unofficially – yes, of course. Almost all software has a back door. But I'll deny it if you squeal."

"Thanks. I have no intention of squealing. Just wanted to know."

"Why?"

Mark explained about Jack and his dream. When he finished, Greg said, "That sounds pretty farfetched to me. As far as I know, you're the only person outside the company to know that B-Lock has a back door."

"But it would explain why no attacks were logged. And what about former employees?"

"Anytime someone with knowledge of the backdoor leaves, the code is changed. And anyway, they all signed ND agreements, like you have."

"Right, and we all know how well non-disclosure agreements work. But if the code is changed when employees leave, and Jack has access to the back door, then..."

"Then a current employee has been Jacked," Greg completed. He frowned thoughtfully. "Let me poke around, and I'll get back to you."

"Be careful, Greg," Mark said. "I've been warned that it can be dangerous just to look into this. It's supposed to be like a living organism, so it would protect itself like any organism."

"No problem. I can be discreet. Thanks for telling me this." He broke the connection.

Mark worked until lunch. After lunch he took a break and went for a walk. He tried to ignore the question of Jack, but it kept bothering him. As he returned home he ran into his neighbor.

"Hi Rob," he called.

Rob turned to face him. Rob was a vacationer, and had several holocams and other devices surgically implanted. He took vacations that were exhaustively recorded, down to the slightest detail, and played on RealVision. The job was not one Mark would want, though Rob seemed to enjoy it. "Hi, Mark," Rob replied.

"Looks like you've got some new equipment," Mark commented.

"Yeah, the latest stuff." For someone who wasn't used to Rob, it might be disconcerting to face the battery of cameras and other devices. Mark knew Rob well enough to overlook the equipment, but did notice when things changed. The recording lights on the holocams flashed

on, and Rob said, “Smile. These new cams are remarkable. And they include enhanced capture of senses other than sight, like smell. So I am recording you for posterity. I’ll send you a copy of the holo later. You’ll be impressed. I was.”

Mark laughed. “If you’re impressed, I know I will be. Where are you headed next?”

“The Himalayas. Got a contract to accompany an ascent of Mount Everest.”

Mark whistled. “Wow. That is really something. Going to broadcast live?”

“Yeah, by subscription. And, of course, it’ll be available later on RV. It’s the first time since the 90s that an ascent has been broadcast live. I hope we have better luck than that one – I think they lost seven or eight climbers in a storm.”

“Well, break a leg,” Mark said. He and Rob both laughed, then said their goodbyes. Mark returned to work.

Mark was finding it more and more difficult to concentrate on his work. It was also a pain to thoroughly “disinfect” mail from trusted sources, but he stuck to it. Actuaries were nothing if not determined.

He did find a suspicious e-mail. It passed his firewall and virus checker, but it refused to open when he tried it with an old text editor. And then it disappeared. He blinked, and checked again. It was gone, without a trace. He couldn’t even recover it with any of the system recovery tools. He thought about that for a few minutes. He considered calling the person who had purportedly sent him the missive, but decided not to. It was easy enough to fake an address, and if the person were “Jacked,” the call would only alert him (or her or it). Better to just let it slide. He decided that he would let Nita know. He paged her.

“Hi, Mark,” she answered.

“Hi Nita. How are you?”

“Fine,” she answered. “What can I do for you?”

“I just got a funny e-mail – thought I’d ask if you had any similar experiences.” He told her what had happened. “And anyway, I wanted to let you know.”

“Thank you, Mark,” she replied. “I have not had any similar experience like that. By the way, I thought you might be interested in looking at the information I have gathered so far on Jack.”

“Sure. Send it on.”

She hesitated a moment as she compiled the data and composed the e-mail. “There,” she said. “I sent it. Let me know what you think.”

“Will do. See you Saturday night.”

He checked his mailbox. Sure enough, the mail from Nita was waiting for him. He started to open it, but then some whisper of caution made him stop. The mail had passed the firewall and virus checker before it hit his mailbox. But so had that other message. With deliberate caution, he opened it with the text editor.

And it refused to open.

And then it too disappeared.

He sat stunned. Could it be? Had Nita been Jacked? How? Her defenses were better than his. But had she applied them as rigorously? Had she unthinkingly opened an e-mail from a trusted friend, maybe even someone at “CC Today,” and been infected? His thoughts whirled

around and around. Finally he called Simon. The phone rang and rang with no answer. Evidently Simon didn't even have an answering machine.

He was too restless to sit, so he grabbed a snack and then hit the trails in the neighborhood again. Walking usually helped him think, but today he walked for a couple of hours and finished his walk still uncertain of what to do. As he approached his house in the gathering dusk, he saw Rob talking with several policemen. "Hey, Rob," he greeted. "Need a character reference?"

One of the policemen asked, "Are you Mark Ysermann?"

Mark, sobered by this question, answered, "Yes, I am. Are you looking for me?"

"Yes, we are. We would like for you to go with us. We have some questions we would like to ask."

"About what?"

"Let's just go, and we'll explain it all to you when we get downtown."

"Am I ... am I being arrested? For what?"

"If you'll just come with us."

"Of course." Mark was confused, but got in the patrol car, and sat silently as they went to the police station. He accompanied the officers inside, and they settled around a conference table.

"Now, Mr. Ysermann," a plain-clothes detective asked, "you have a CC connected to the 'net? Do you mind de-activating the link for a few minutes?"

"Why, yes," he answered, bewildered, complying with the request.

"Do you know Greg Jaines?"

"Yes," Mark said. "Why? Is Greg in some sort of trouble?"

"Mr. Jaines is dead," the detective replied.

"Dead! What happened?"

"We were hoping you could tell us," the detective rejoined.

"I talked with him today at," Mark hurriedly consulted his call log, "at 10:24. He was fine then."

"What did you talk about?"

"I'm an alpha tester for the software the company Greg works – worked for. We had a short discussion about that, and then we terminated the call. That's all. Nothing else."

"Did you go see him, later that day?"

"No. I worked. I work at home, you see..."

"Then why are there witnesses who say you visited him?"

"What?" Mark asked, unbelievably.

"And not only visited him, but argued violently with him."

"That's a lie," Mark objected. "I told you, I was at home."

The detective whispered to another policeman, then asked, "Do you have any witnesses to back up your story?"

"I work alone, at home. No one...wait," Mark said. "What time? What time are you talking about? I talked to my neighbor, Rob Petrie, yesterday after lunch."

“Is that the vacationer we met when we picked you up?” asked one of the uniformed cops.

“Yes,” Mark said. “In fact, he recorded our conversation. He had just gotten some new cameras.” He sighed with relief. The police whispered among themselves, then the detective said, “Please wait here, Mr. Ysermann,” and they all left.

Mark waited. After a few minutes, he poked his head out of the conference room, but everyone ignored him. He returned to the table and sat. He tried to work, but got nothing accomplished. His mind was in a whirl. Nita – Greg. Greg must have done something to tip off Jack. Mark bowed his head, feeling grief. Greg was a long-time friend. Even though Mark had warned him, Mark still felt guilt at his death. And why did the police think Mark had done it? They said there were witnesses that had seen or heard him argue with Greg. Someone had set him up. Could it have been Jack? But how? Why? Greg’s death couldn’t be a coincidence.

At that point, a different plain-clothes detective entered and sat across from Mark. “My name is Detective Sergeant Watkins, Mr. Ysermann. Thank you for waiting. Let me explain what has been going on. When we began investigating Mr. Jaines’ death, our initial findings indicated that *you* were our best suspect. A witness placed you at the scene at the appropriate time, and some computer records at Symantec also indicated that you were present.”

“But I wasn’t!” Mark protested. “If you’ll check with ...”

Detective Watkins held up his hand. “Please, Mr. Ysermann. We *have* checked with Mr. Petrie. He corroborates your testimony. His recordings place you beyond doubt at your home at the time the murder took place. And a closer look at those computer records putting you at the scene indicate that they had been hacked.”

“And the witness?”

“The witness has disappeared. So now you are off the hook, Mr. Ysermann. But I am curious as to why you were implicated in the first place.”

“Why I was set up, you mean,” Mark said.

“Yes. Why were you set up?”

“I ... I don’t know, unless I was just convenient. I mean, someone must have seen records of my call to Greg, and knew I worked alone, so I would probably not have an alibi.”

“That’s a lot of assumptions.”

“But it’s the best I can do. I’m sorry.”

The detective regarded him thoughtfully, then stood. “Thank you for coming, Mr. Ysermann. I’ll have one of our units run you back home. And please, if anything else *should* occur to you that might help us, let us know.”

The police cruiser dropped Mark at his home. Fortunately Rob was away, so Mark didn’t have to explain anything. He went inside and thought. Finally he called Simon Welles again, and was relieved when he answered.

“Mr. Welles, this is Mark Ysermann.”

“Mr. Ysermann, I’m glad to see you’re back home.”

“How did you know?”

Simon chuckled. "I am not entirely without resources. In this case, though, it was a mutual friend."

"Nita."

"Yes, Nita."

"But how did she know? Simon, I'm sure that Nita..."

"Has been Jacked. Yes, I thought so."

"I need to see you. Can I come to your place?"

"Yes, of course. Do you need my address?"

"I have it. And directions. The 'net, you know," Mark said.

"Then I'll see you shortly. Goodbye."

Mark took a circuitous route, doubling back and parking in a mall lot for several minutes. He didn't see anyone following him, though he wasn't sure he could spot anyone anyway. He also, after a few minutes thought, de-activated his CC and biotech link and the car's GPS and AutoLINK systems. He left the city and followed the route into the country. By the time he reached Simon's house, he felt that civilization had been left far behind.

Simon was waiting for him on the porch. "Hello, Mr. Ysermann," he said, and they shook hands.

"Call me Mark."

"And you can call me Simon." They went inside. "I see you brought some clothes. I thought you might," Simon commented. They sat at the kitchen table. "So, Mark, we seem to have a situation."

Mark shook his head dazedly. "Situation doesn't begin to describe it, Simon. It seems like a million years ago, but just two days ago life was normal, Greg Jaines was alive, and I had never heard of Jack. And now..."

"And now, you feel like your life has been high-jacked. Pun intended."

"Yeah." Mark laughed silently. "It sounds like a bad sci-fi story. Except it's real."

The two men sat without speaking for a few minutes. Finally Mark said, "Thanks for letting me come. I wasn't sure where else to turn."

"You are entirely welcome. Mark. I think we'll both be better off if we combine forces. I assume you've scratched your CC."

"I deactivated it."

"I'd delete it."

"I thought about it, but I have plans for it."

"What plans?"

"I can't hide forever, Simon. I have to do something. If Jack sees me as a threat – and it must, since it's tried already to get me – then I have no choice. I have to fight back. And I'm mad, too. Greg was my friend. Nita was – is a friend too."

"Don't let anger make you lose your head."

"I won't."

"So what *are* your plans?"

Mark stretched. “You probably know I’m an actuary, Simon. I make my living by creating sophisticated models. And my plan is to use models to find out how Jack operates so I can see how to counter it. But now, I’m exhausted. I need some sleep.”

Mark elaborated his plans the next morning over breakfast. “I’ve spent my entire career modeling, Simon. I’ve developed quite a bit of expertise in the subject. My plan is to create a model of my CC within the CC. Everything – software, mail facilities, utilities, interface, BIOS, BOS, the whole works.”

“And when you’ve created the model, you let Jack in?”

“Exactly. But into the model of the CC – the model inbox, in this case. I’m sure I have some Jacked messages waiting. And I open it in the model, and I watch to see what it does, how it manages to do whatever it is that it does. And I stop the model if I need to.”

“If you can. It could be dangerous.”

“No more dangerous than doing nothing. Anyway, if I can see what it does or look at the code, maybe I can find a way to counteract it. Create an anti-Jack virus. Or an inoculation of sorts.”

“It’s a good plan, Mark,” Simon said. “I believe you’re right. Jack is after you. You have to do something, and I can’t think of a better plan.”

“Thanks, Simon.”

“I have a few suggestions. Limit the clock cycles on your model. And restrict multi-pathing. That will give you a greater degree of control and more time to react.”

“You’re right, Simon. Thanks for the suggestions.”

“Can I help?”

“As a matter of fact, you can. You have a PC?”

“Yes. I’m not really a Luddite, you know.”

“OK. Take this,” he said, giving Simon a TC. “It’s the source code of B-Lock. Locate the back door; I have a feeling that I may need it. And now, I’d better get busy.”

Mark reactivated his CC (but not his link to the ‘net) and spent the next three days constructing his model. He drove himself feverishly, treading the fine line between too fast and not fast enough. He hardly noticed what he ate or drank.

He took a brief break on the second day and stumbled into the kitchen. Simon was there, and he looked up questioningly as Mark entered.

“Just taking a break,” Mark said, and dropped into a chair, massaging his stiff neck. He yawned, and looked over at Simon. “Making good progress. By the way – out of curiosity – why did you turn your back on technology?”

Simon replied, “I didn’t totally turn my back on technology. Mark. Oh, I know what you mean. It was a little over a year ago. All of a sudden I realized that technology, instead of enhancing my life, was taking it over. I was becoming a driven person; my relationships were electronic rather than personal. I felt – I felt like technology was like Jack – taking over my life, running it, instead of me running my life. And I saw the potential for big problems.”

“Such as Jack.”

“Such as Jack,” Simon agreed.

Mark smiled wryly. “I’m coming around to your way of thinking. And lately I’ve realized I’ve used technology as a crutch rather than a tool.”

“Anything I can do to help you with your plans?”

“Keep looking for that back door,” Mark answered. “I’ve got another day or so of programming ahead of me. Lucky I have so much modeling experience. I’ve been able to re-use modules as well. And of course, when the model is finished, I’ll have to populate it with programs and data.”

“That in itself leads to some interesting questions,” Simon said. “Are there only certain CC users Jack can attack? Do you have to be running a certain operating system, or mail system, or utilities? Why haven’t all CC users been ... absorbed? There are several million CC users worldwide. How many are Jacked?”

“I don’t know the answers,” Mark said. “And I can add another question. Greg was killed; why haven’t you or I been attacked?”

“I think I’m regarded as a kook, as no real threat,” Simon said. “And since you deactivated your links and GPS, it probably lost track of you. It or they probably don’t know where you are. And I put your car in the garage, so it couldn’t be spotted by satellite or heli. Yes, I’m paranoid,” he said seeing Mark’s raised eyebrows, “but you have to remember even paranoid people have enemies.”

Mark laughed shortly. “Back to work,” he said, rising to his feet and turning to leave.

At last his model was complete. He spent a few more precious hours going back over it, debugging, modifying, perfecting. As a test, he reactivated his ‘net links, started the model, and checked his e-mail in it. He selected an innocuous spam from the junk mail file and opened it with a text editor. It did not disappear; it was exactly what it seemed to be. He opened it again with the standard CML reader, and it opened perfectly. He took a deep breath, and went to find Simon.

“OK, Simon, I’m ready.”

“Going for it now?”

“Yeah. I’ve been thinking about what you said – about Jack not knowing where I am. I had to re-establish a link to the ‘net to test my model. I figure in doing that, I gave away my location. So I want to do this before anyone shows up with a blunt weapon.”

“Good luck,” Simon said. “What can I do?”

“If you’re a praying man, you could pray. Other than that – nothing.”

Mark took a comfortable seat. He started the model and re-activated his biotech link. From within the model he opened his mail server. There were hundreds of e-mails waiting. He winnowed through them slowly. Finally he came upon one from Nita. He took a deep breath, ratcheted down the clock speed in the model, and opened the mail.

Some time later, Mark got up slowly. He was stiff with tension and from sitting still and concentrating. He stretched and went to find Simon. He found him on the porch, sitting in the swing and watching the woods. Simon looked up as Mark came out.

“I’m OK,” Mark said. “I haven’t been Jacked.”

“Were you able to open a Jacked message?”

“Yeah.” Mark sat down.

“So what did you learn?” Simon asked.

Mark considered his answer. “Part of this is conjecture. I observed Jack’s behavior, and was also able to look at some of the Jack code. As near as I can tell it creates a new CC, in the cerebrum rather than the cerebellum. Then it inhabits the new CC and changes the CC attribute to hidden.”

“Hidden! That’s impossible.”

Mark shook his head. “No, it’s not. I watched what it tried to do. It can be done, but it has to have the CAB files for Brainux. So that’s partially an answer about who it can infect; if you don’t have the CAB files, Jack can’t do its dirty work, so you’re safe. I think.”

“But why doesn’t Jack carry the code necessary rather than using the CAB files?”

“I don’t know, unless it would make the code too unwieldy. I just don’t know.”

“Is it ... is your model still active?”

Mark shook his head again. “I suspended the model. I was scared to let it go for long. So there are probably other things Jack does that I don’t know about.”

“Do you think it’s possible to construct an anti-Jack virus.”

“Yeah, I think so. And another thing – Jack sends an e-mail to the originator of the message when it starts. It did that before I stopped the model, so Jack must think I’ve been Jacked. I’ve shut down my ‘net links just in case. But now I need to work on that anti-Jack program.”

Simon was facing away from Mark, looking out into the dark woods. “And another thing, Simon,” Mark continued, “When I looked at the code, I found information on the original code. And the originator ... was listed as Simon Welles.”

Simon said nothing, just continued standing at the porch rail. “Did you hear me, Simon?” Mark asked.

Finally Simon replied, “Yeah, I heard you.”

“How could you do it?”

Simon turned to face Mark. “It’s not what you think, Mark.”

“What is it, then? How can you justify what Jack is or what it does? How can you justify killing Greg or framing me? What else has Jack done?”

“I...I didn’t do those things. I mean, yes, I wrote the original code. But it wasn’t meant to do any of that. It didn’t do any of that when I wrote it. It was meant to just be a harmless CC virus ...”

“Harmless!”

“Yes, harmless. It was. It was supposed to illustrate the potential for CC viruses, since a lot of people thought they were inherently impossible. But somebody else must have modified it. It was supposed to set up a separate partition with the CC and e-mail me. I was going to keep track of the infections, and report the results in my column, back when I was writing one. But it got loose, and began to change.”

“You lost control of it.”

“Yes. It ... it ... I got frightened. Instead of being harmless, it became ... it changed, and kept changing.”

“So that’s why you dropped your CC.”

“Yes. That mostly, although what I told you before is true too.”

Mark and Simon looked at each other in silence. Finally Simon said, “Look, maybe what I did was wrong, but it got away from me, and I did what I thought I could. I’ve tracked it, and tried to alert others to it. And maybe we’ve finally solved it.”

Mark said, “*We!* I took the risks, Simon, that you were afraid to take.”

Again they looked at one another, then Simon sat down, putting his head in his hands. “If you knew how much I’ve tried to stop it. I’m sorry, but I did what I could.”

Mark was silent for a moment, then said, “Look, let’s drop this now. The important thing is to develop a program to combat Jack. Did you find that back door?”

“Yes. Here are the details. And I have some ideas on what to do.”

“OK. Let’s get busy.”

The next night, he waited impatiently outside of Ruchi’s Restaurant. Would Nita come or not? He paced back and forth. The trap for Jack was set, and Nita was to be the first ... *victim* was the wrong word. Anti-victim? He and Simon had debated what would happen if Jack were removed, but came to no conclusive results, although they hoped the people would revert to normal. They weren’t even sure the victims consciously knew they had been Jacked. There were a lot of unknowns. He mentally crossed his fingers, and went over the anti-Jack plans one more time, probing for weaknesses.

Finally Nita came in. “Hello, Nita,” he greeted her. “Hey, did you see the e-mail Simon Welles sent?”

Nita frowned. “No, I do not think I got any ... no, here it is just now. What is it?”

“Look at it first,” Mark urged, “and we can discuss it later.”

Nita frowned in concentration, then seemed to freeze. Mark waited anxiously. Was the program working? It was supposed unhide the second CC, send itself to any e-mail addresses it found, then delete the second CC. Would it work? What would happen?

After a few seconds Nita shook her head slightly, and glanced at Mark as though seeing him for the first time. “Why, hello Mark,” she said, smiling brightly. “Let’s eat.”

Mark smiled in relief. He had received an e-mail from Nita in the interim – a copy of the anti-Jack program. So his had been one of the addresses in the Jack CC, and the program had worked perfectly. He took Nita’s arm, e-mailing Simon at the same time about the results of their efforts.

“Let’s eat,” he agreed, smiling with relief. “Maybe we can talk about Jack.”

Nita laughed. “Jack! Let’s forget about work and urban legends, and just enjoy the evening.” She hugged him impulsively. “For some reason, I feel like celebrating.”

“If you only knew,” he replied. She looked at him quizzically, and he laughed and said, “Never mind. Let’s just celebrate.”

Transformations

Chapter 1: Data Mining

Monday, May 13, 2002 - 9:05am

Erik Christiansen stared at the data in disbelief. He decided that something had to be wrong. Erik was an actuary working for Health Guardian Mutual, a mid-sized insurance company in Omaha, Nebraska. As project manager for a concept test project using data-mining techniques, Erik was trying to identify and target high-value health insurance customers in Iowa. He reread the data.

Erik stared at the numbers on his laptop a little more and then reclined back in his desk chair. He rubbed his eyes and looked out his window northeast toward the bluffs, on the east side of the Missouri River. A clear, sunny day in May, the dead of winter was now overtaken by bright green leaves on the trees. As his eyes moved back to his office, Erik noticed a hawk sitting among a couple of dead branches that jutted out the top of the grand old cottonwood tree standing guard over the other trees outside his window. Health Guardian's campus to the north and east of the main building was beautifully landscaped, with tree-lined walking paths weaving through it.

Erik's eyes returned to his laptop. "What the hell?" he said, as he studied the report again. The numbers showed geography as the highest statistically significant predictive variable for high customer value. When he dug deeper into the results, it showed that policyholders in certain zip codes in southeast Iowa had the lowest morbidity rates.

"Why would geography jump to the top of the list?" he asked. Clearly, health claim costs are different by geographic locations, but the data points entered were already normalized for geographical differences. "This makes absolutely no sense! What's up with the zip codes starting with '525'? There are virtually no high-cost diagnoses. No cancer, stroke or heart disease." Erik pulled up a zip code map of Iowa. "All of these zip codes correspond to small towns between Bloomfield and Ottumwa, Iowa. Can this data be right?"

Erik called in his data mining actuarial team manager, Hailey Campbell. An up and coming actuarial star, Hailey was flying through her actuarial exams faster than anyone ever had at Health Guardian Mutual. In her two years she had been at Health Guardian, Hailey built up a reputation of being an actuary that gets things done quickly and efficiently. Even the marketers liked her.

"Hailey, these numbers don't look right. Can you check them out?"

"I already did. I knew you'd question them," Hailey said as she sat down in one of the chairs in front of Erik's desk. "I did the same thing. In fact, I went a step further. I had

some of our claims service reps call some of the doctors' offices in these towns and ask them if they, in fact, were not seeing any diagnoses of high-cost diseases."

"And?" Erik asked.

"And they said that they weren't. They found it odd as well but thought it was just coincidence. Nearly all of their visits now are for accidents and small health problems such as bacterial infections and viruses." Hailey opened the file folder she was carrying and pulled out a chart with a graphed line trending downward. "And if you do a time series study of this data, you'll see that this trend started out not quite 15 years ago and has continued to this present rate where they see virtually no cancer, heart disease or strokes." She let Erik study the graph for a moment. "The provider offices said that there has always been a problem with the local hospitals struggling to survive in rural Iowa and this lack of demand for medical services has put additional pressure on keeping doctors in the area."

"I don't get it." Erik rubbed his temples as he looked at the data. "We always see higher rates of cancer in rural areas due to the use of farm pesticides and herbicides. At a minimum, we should be seeing these diagnoses coming through."

"Well, here's something else weird." Hailey added. "One of the administrative assistants at a doctor's office near Drakesville, Iowa, said something cryptic on the phone to one of our reps. She said that we needed to come out there and talk to some of the people if we wanted to understand what was happening."

"What was happening? What? I don't get it. What's happening?" Erik gave Hailey a puzzled look.

"She wouldn't say." Hailey shrugged her shoulders. "In fact, that's all that she said to the rep. She just hung up after that."

Erik thought for a moment. "Well, Drakesville is only about 4 hours away. Let's put a small team together with the two of us, our medical director and our claims manager, and go on a road trip. If there is any truth to this, we have to find the underlying cause."

Chapter 2: Drakesville

Thursday, May 16, 2002 - 11:37am

A few days later, after coordinating everyone's schedules and making travel arrangements, Erik and his investigative team left the office and arrived in Drakesville by lunchtime. Besides Erik and Hailey, the team had Dr. William "Bill" Medfield, the medical director for Health Guardian, and Ed Kapsner, the head of Health Guardian's claims department. They had made arrangements to have lunch with Lois Peterson, the administrative assistant to Dr. Robert Quillan, a local general practitioner near Drakesville.

Drakesville is a very small town with only one street, Main Street, and eight buildings. The US Post Office was the most modern and best-maintained building in town. The restaurant was a very small family-owned diner with six 1950's vintage Formica top tables. The vinyl-upholstered chairs had seen their better days. Five barstool seats lined up in front of a bar-like serving table. Three people were sitting at a table at the far end of the diner. They were talking and eating their lunch when, just like a scene from a bad "B" movie, everyone turned and looked as the strangers walked in.

Lois Peterson was sitting alone at the second table in. She was obviously waiting for the four visitors from Omaha.

Erik walked up to her and introduced himself. "You must be Lois. I'm Erik Christiansen. This is Hailey Campbell, an actuary at Health Guardian, Dr. William Medfield, our medical director, and Ed Kapsner, the head of our claims division. So, you work for Dr. Quillan?"

"Yes, I do," Lois said, nervously glancing at the others sitting in the diner. She seemed uncomfortably conscious of their curious stares. Her hand was noticeably shaking as she extended it to shake hands with Erik and the rest of the team.

They all sat down at the table with Lois. Erik tried to put Lois at ease. "Is there something bothering you? Are we making you uncomfortable?"

"It isn't you," she replied as her eyes scanned the room to see who might be listening. "It's what I have to tell you. This is very difficult for me and you must promise me that you won't ever use my name when talking about this." She leaned forward, "Before I go on, you must promise!"

"You have our word. We will keep this conversation confidential," Bill assured.

Before she could go on, the waitress came and took their lunch orders. As she walked back to the kitchen, Lois continued.

"Well..." she hesitated. "This all started back in 1989. Nobody from this part of the state wants to talk about this stuff for fear of being labeled a looney-bin backwoods farmer, but everyone down here knows about it."

"Knows about what?" Ed inquired.

"The encounters," replied Lois. "They started in 1989. One of the local farmers woke up to his dogs barking wildly one night. He looked out and saw strange lights hovering over his alfalfa field. They floated about 30 feet above the ground for over 45 minutes. He stepped outside to get a better look and he was shocked that they made absolutely no noise. Then, without warning, they just zipped off, like a bolt of lightning." Lois raised her right hand and made a quick motion as though she drew a quick imaginary line in the

air. “They went off to the northeast. The next day he went out to the field to find strange markings and depressions burned into the field. In fact, those spots have never fully recovered. You can still see them today. Also, one of the nearby haystacks had a bucket-sized scoop cut out of it. It looked like it had been cut out with a laser.”

Lois looked at the disbelief on their faces. “Now I know how bizarre this all sounds to you folks. I felt the same way and so did that farmer. He didn’t want any news of this to get out because he knew folks would claim he’d been drinking or he was just seeing things. So, he quietly called in a physics professor from a university to come have a look. In fact, I think that professor was from Omaha. University of Nebraska, I think.”

“Probably contrary to what you city folks think, many of the farmers around here are college-educated. In fact, the farmer I’m talking about has a degree in business from the University of Iowa, not exactly a bad school by anyone’s criteria. He didn’t want anyone calling him a quack, but he knew something unusual happened.”

Erik interrupted, “This is a fascinating story, but what does this have to do with nobody having cancer or heart disease around here.” Erik didn’t try to hide his impatience. Did they just drive four hours to talk to some delusional woman about aliens?

“I’m getting to that.” replied Lois. Lois was empathetic to Erik’s feelings. “I can tell that you don’t believe me and I understand why. But you will believe me when you talk to more people. These encounters have continued over the years. And a bunch of us folks from around here think that they have been messing with us somehow.”

Lois went on, “There have been many stories just like the one I told you. In fact, they get even stranger. There have been lights floating above houses in the towns around here. There have been lights hovering over fields. There have been those crop circles like the ones that you hear so much about in England. There have even been daytime encounters with strange craft landing right in the middle of gravel roads. People have had to wait for them to take off before they could pass through the road. Some people have actually seen these little gray people wandering around in fields with strange light rods in their hands.”

Bill inquired further, “When you say ‘messing with us’, what do you mean by that?” Bill was also finding the story hard to accept, but he maintained his professionalism.

“Genetically, we think,” Lois said. “We don’t know what they are doing, but somehow it is affecting the people around here. Of course, nobody is complaining about not getting cancer. But on the other hand, we don’t like the feeling that we are just lab rats for someone or something to tinker with.”

“And you think that this ‘messing’ with your DNA is eliminating cancer around here?” Erik answered with a strong tone of disbelief.

“Well...,” Bill jumped in. “If there is someone messing with your DNA, that is something we can look into. We can have a geneticist run tests with blood samples and

see what we can see. There have been a lot of advancements in genetics recently and we do know which genes are responsible for some of the more common forms of cancer.”

“And that physics professor, do you know his name?” Hailey asked. “I can try to find him and find out what he knows about this stuff.”

“Lois, can you help us find a few folks that would be willing to participate in having their DNA analyzed?” asked Bill.

“Yes, I’m sure I can find folks willing to help, but on the condition of absolute confidentiality. Many of us around here are frustrated about these encounters and would like some answers. We have way more questions than answers at this point. But, we are all very fearful of being labeled crackpots. You have to make sure our help is kept quiet.”

The waitress returned to the table with their lunch orders. She handed each person their lunch and then checked on her other customers sitting at the last table in the diner.

Lois continued with a few more stories and then they ate lunch. Lois knew that the visitors from Omaha were not accepting her stories, but she knew what they would hear from other people as well. They changed the subject to mundane things like the weather as they finished lunch.

Afterwards, Lois gave Erik the names of a few other people in the area to talk to. She had already called them to ask for their help. They were expecting them. The team interviewed each person just as Lois had recommended. And as she predicted, they were told nearly identical stories from everyone.

Thursday, May 16, 2002 - 5:42pm

After all of the interviews, the team headed back to Omaha. Erik spent the entire four-hour ride thinking about what he had just heard. The car was quiet except for the sounds of the tires rhythmically clicking on the seams in the pavement.

Chapter 3: Seeing the Code

Wednesday, May 29, 2002 - 10:08am

Several days had passed and Erik spent most of them thinking about what he had heard in Drakesville. All of that thinking had put him on edge. He had never believed in aliens and flying saucers, and the idea of them possibly being real shook his emotional foundation. Erik found himself irritable and impatient with his coworkers. He knew these thoughts were affecting him in a negative way, but found it difficult pulling himself out of it. His mind continually returned to it. Staring at the photos of some of the markings that have appeared in the fields around Drakesville didn’t help either.

Hailey received the photos from Dr. Jack Kasher, the physics professor at the University of Nebraska who first investigated the UFO sightings from the Drakesville area in 1989. He confirmed to Hailey that he had heard nearly identical stories and that his findings from soil samples and other studies confirmed that something unusual was happening there. The study of the haystack samples where the scoop was taken did show that some kind of high-heat tool, similar to a laser, had to be used to create the cut endings studied under a microscope. There was no plant tissue “crushing” that would be associated with some kind of a knife. Based on the amount of soil compression in some of the field markings, whatever created them had to have weighed over 10 tons. And in a few of the markings, the radiation level measured twice as high as the surrounding areas and background.

Bill Medfield made arrangements with a good friend of his, Dr. Paula Gretskey, a nationally renowned geneticist at Louisiana State University, to conduct tests on the blood samples taken from some of the Drakesville area residents. She flew to Omaha to help select the people being tested. Two of the people tested were purposefully selected because their parents and all their siblings had been diagnosed in the past with colon cancer. They should see the weakened gene that causes colon cancer in the test subject, just as they would in both of their parents and all of their siblings.

Paula was in Bill’s office discussing the results when Erik and Hailey walked in.

“Erik, Hailey, please have a seat. Paula was showing me the results of these genetic tests. You’ve got to see this,” Bill said, shaking his head in disbelief.

Paula pushed a document across the table to Erik and Hailey. It showed photos containing a series of dashes that represented some kind of DNA coding. Next to each photo was a matrix of numbers.

“What it says,” Paula explained, pointing to the data, “is that, where we would expect to see a damaged gene associated with colon cancer, we actually see a perfectly healthy gene with no sign of weakening or mutation. We tested this person’s siblings and parents too. They all have a weakened gene here, but our test case did not.” She looked up from the document. “This is virtually impossible. One could even say ‘miraculous.’ There is no known gene therapy available today for humans to correct the damaged gene responsible for colon cancer.”

Erik, who was reaching his limit on the weird-o-meter scale for the day, offered even more for the two doctors. “Take a look at these photos. These are some of the crop markings or ‘crop circles’ around the Drakesville area. Dr. Kasher conducted plant and soil sample tests from these markings. He found that the plant tissue changes seen here could not have been made by bending the plant stalks. These kinds of changes would have required a sudden energy burst like a microwave.”

Paula scooted closer. “Can I see those?”

Erik slid them over to her. She studied the photos. Suddenly her eyes widened. She saw a pattern she recognized. “What!?” she said. “That can’t be!”

“What is it?” Erik asked.

“This could be a DNA code stream,” Paula said pointing to a pattern in the picture. “I won’t bore you with a bunch of genetic mumbo-jumbo, but this could be a partial code. Do you have other pictures?”

Hailey held out the other photos from Dr. Kasher. “The back of the photos are numbered and they form a grid from a field 10 miles north of Drakesville.” Hailey spread the pictures out on the table.

Paula rearranged the photos facing up to make a composite picture of the field. “This is bizarre!” she exclaimed. “This can’t be! It looks like a simple decode list for some genetic codes streams. This symbol here looks like an eye and next to it are small circles arranged such that they could correspond to the gene responsible for eye color.”

“And here,” she said pointing to another area of the field. “This symbol could easily be viewed as a cell. And next to it are more of those circles arranged such that they could be associated with a gene tied to an enzyme that regulates a common cell function. Is this a joke!?” Paula looked up. When no one laughed, she returned to studying the photos.

She went on, “But down here, what is this? I see the small circles, but I don’t recognize the pattern. And what are they next to? It looks like a person reaching up to a sun. What is that supposed to be? And this other set over here. Two people with a big arc connecting their heads? I don’t recognize the circle pattern next to that one either. This looks like a decode list, but I only understand part of it.”

The others seem paralyzed while staring at the photos.

“Folks, I’m experiencing a bit of information overload. I can’t take much more of this right now,” interrupted Erik. “I need to take a break.” That was Erik’s code for ‘It’s quitting time and I’m heading to a bar.’ Erik needed a drink.

The others agreed. They all needed a drink.

Chapter 3: Code Reflections in a Beer Glass

Wednesday, May 29, 2002 - 5:03pm

Erik, Hailey, Bill and Paula reconvened at Mr. Toad’s, a popular bar in the Old Market area of Omaha. Mr. Toad’s has a small beer garden just outside the main bar. A couple of large oak trees have tables and benches circling them. A black wrought-iron fence surrounded the beer garden. With a calm wind and 75°, it was the perfect place to be in the afternoon to kick back, have a drink and watch people walking by.

The waitress had just dropped off the first round to the solemn group. They were overwhelmed with all of the information hitting them in such a short period of time.

Hailey broke the silence. “This is all getting just a little too weird for me.” Her comment was met with 3 slowly nodding heads all still staring at their drinks.

“Does anyone buy this?” Erik continued. “I mean this UFO crap? I’m just having a lot of problems accepting this. There has to be a down-to-earth explanation for all of this.”

“Well, I’ve seen a lot of things in my career as a physician, but I’ve never experienced anything like this before,” offered Bill.

Paula piped up with a bit more energy than the others, “I’m going to look into this decode list thing more back at LSU. Either this is a very clever joke or there is something to this. The scientific method prohibits us from pre-supposing the outcome. But if we make any sense out of this decode list, I think I would have to say that I will be leaning toward the ET explanation. Maybe we can even learn ET’s phone number in the process.” The movie reference made a couple of the team members crack a smile.

The group decided to change the subject and decompress. They told Paula some of the history of the Old Market area and then exchanged barbs with her on their respective college football teams, Nebraska and LSU. Paula was undaunted by being outnumbered by a bunch of rabid Husker fans. She stood her ground and reminded the team about how bad Nebraska got their butts kicked by Miami in the national championship game earlier that year. A game she claimed Nebraska didn’t deserve to be part of in the first place. She definitely surprised the team by busting the bookworm scientist persona she held up until that moment. They all got a good laugh out of the friendly banter.

Chapter 4: Opening the Code

Friday, May 31, 2002 - 3:15pm

When she returned to LSU, Paula asked 3 graduate students to help her research the genetic code patterns. She showed them the partial genetic codes and asked them to try to find out anything they could on the two patterns that they didn’t recognize.

With the human genome project recently completed, they had access to the entire genetic map from which they could try to match the patterns. The map included all of the approximately 30,000 genes and 3 billion chemical base pairs that make up DNA.

The grad students accepted the project and got special access to a new Cray X1 Supercomputer. LSU was granted temporary access to an X1 to help Cray test its capabilities. LSU used its beta-test site status for modeling some complex genetic problems. The X1 was going to be released to the market officially later that fall.

The Drakesville project was relatively tiny compared to many of the other modeling projects being set up on the X1, but the grad students were giddy just to have a chance to play with it.

They worked on the project request over the weekend and met with Paula Monday morning with their findings.

Monday, June 3, 2002 - 8:20am

“All of the patterns do correspond to identified genetic code sets in the human genome,” said Marie, a doctoral student studying recent revelations from the human genome project. “But here is the unusual finding. This code here, the one that you found paired with the picture of a person reaching up to a sun, has an unusual property to it. We found this sequence in the human genome, but it appears in no other animal species or plant species. It is unique to humans. We looked at every genetic map in our databases of every animal and plant species logged to date and there was no match except in the human genome.”

“It appears that this partial genetic code is associated with some human trait that is not exhibited in any other life form,” added Alex.

“We know that it’s unique in humans, but we don’t know for sure what it does. This code is part of the more than 90% of the genome that has been mapped, but where the functions are still unknown,” said Jessica.

“What trait do humans have that no other animal or plant possesses? Could this code somehow determine our cognitive abilities or brain size?” Paula asked.

“Well, uh...” Alex stammered, “we don’t think that’s it. We talked about this and we would like to propose a hypothesis based on that picture of the person reaching for the sun, that it is somehow symbolic for peoples’ ability to be spiritual. Or, somehow it is our ability to pray or attempt to communicate with God. No other animal or plant possesses the ability to experience spirituality.”

“We think that the sun in the picture is not a sun but some symbolic representation for God or some deity,” Jessica added.

“Are you guys proposing that spirituality is somehow turned on or off with this genetic sequence?” Paula asked with her eyes showing a mix of curiosity and disbelief.

“Maybe. Or maybe the *ability* to experience spirituality could be turned on or off by this sequence,” Marie replied. “People obviously have some kind of choice whether they want to do this or not, but the ability is always there. Whereas there is no evidence that a fish or a squirrel or a tree exhibit any kind of ability to pray or experience spirituality as we know it.”

“Do you guys understand the significance of what you are proposing?” Paula asked. “You are suggesting that we might have uncovered the first direct link or doorway between the physical world and the spiritual world. Obviously, your hypothesis is unproven, but extensive study might be able to prove it. I think my friends in Omaha are going to have cardiac arrest when I tell them your hypothesis.” Paula contemplated a bit more. “Dare I ask, but did you learn anything more about the fourth code set?”

“We learned that this code set is not unique to humans. However, if you think our first hypothesis has any merit, then you won’t be surprised by our second hypothesis,” Marie said with a nervous laugh. She sensed Paula’s skepticism. “We think that the picture symbolizes some kind of telepathic communication between people. If you look at the picture, you can see each person has eyes and a nose but no mouth. And their heads are connected by an arc. We think someone is pointing out to us the genetic code associated with the ability to communicate telepathically.”

Paula laughed. The laugh was not the kind of laugh one normally associates with humor, but more like a laugh of disbelief. Paula thought she had heard it all, but reality was reminding her that it wasn’t the case. “Now you’re telling me that we might have found a genetic sequence that turns on or off a person’s ability to have ESP? Do you have any more hypotheses for me?”

Paula’s question was met with silence.

Paula made eye contact with each of the students, then she went on. “I want to apologize for my reactions. I’m just a bit overwhelmed with where this trail is taking us. I think your work has been excellent and I appreciate your courage with two hypotheses that definitely challenge conventional thinking. I think I just need some time to think about your findings and try to decide how to proceed. I will let our friends in Omaha know what you found and your hypotheses.”

Chapter 5: Closing the Loop

Monday, June 3, 2002 - 11:15am

Erik hung up the phone after talking with Paula. He sat stunned. Fascinated by what he was learning, but he also was angry and frustrated. This isn’t where this project was supposed to go. He was supposed to do some data mining and make proposals for marketing plan changes. He envisioned more efficient marketing and higher profits coming out of this project not the meaning of life! Now what?

But what could he do now? In one respect, the genie was already out of the bottle and there was no putting it back. Paula and her students were obviously going to study their findings further and test their hypotheses, but Erik had a strong gut feeling they were right. Every time this journey presented information that seemed to be fiction, it ended up being fact.

Erik regained his composure and chuckled out loud. He thought, "I'm going to walk to the chief actuary's office and say 'Well, I don't have any proposals for marketing, but I learned something else.'" Erik laughed again even louder then leaned over and placed his elbows on his knees and pressed his fingertips into his temples.

Erik thought more, "What? Am I nuts? Could I lose my job over this?" Erik could easily picture the top management of his company not wanting to be associated with something so unusual. This is not the kind of press that a conservative insurance company wants. "What is the president of the company going to say? For that matter, why am I thinking so small? What is the President of the United States going to say? If the hypotheses proposed by Paula and her people prove to be true, how will the world react? How do I get off of this roller coaster ride!?"

Suddenly, Erik felt very small. The weight of the information he held in his head was crushing. He added to his questions, "Can this prove the existence of God? Why did the encounters in Drakesville happen? Is humanity ready for this? What are the implications to the different religions in the world? Did space aliens actually do this? Did aliens show us how to unlock these powers? Are the aliens God? Do they want us to think that they are God? Was this an act of God? Is this knowledge good? Is it bad?" He couldn't stop thinking.

After nearly an hour of this activity, a sudden calm fell over him. Erik came to a realization that somehow brought a moment of clarity to him. He sat up and walked straight to the chief actuary's office. He knocked on her door, causing her to look up from a report that she was studying. "Nancy, do you have some time? I need to talk to you."

* * * THE END * * *

All of the UFO sighting stories mentioned in this fictional story are based on actual events that occurred in the Drakesville, Iowa area between 1989 and 1992. These encounters were investigated by Dr. John C. "Jack" Kasher, a physics professor at the University of Nebraska at Omaha (UNO). There are more than a dozen reports of encounters from various people in the Drakesville area.

Some of the more interesting details include:

- In the story where lights were seen hovering over a field and burn marks found the next day, there were two cuts out of haystacks nearby that were elliptical – 8 inches wide by 6 inches tall, appearing about 30 inches above the ground. Two hundred power magnification of the cuts showed no microscopic crushing of the plant stalks. The burn marks and depression marks in the field have never fully recovered. Plant and soil samples taken from these marks were tested by people from UNO's chemistry department and the University of Nebraska at Lincoln's (UNL) Institute of

Agriculture and Natural Resources. They were unable to determine the cause of the burns.

- There are actually two separate reports of saucer shaped craft that had landed on county roads where people had to wait for them to take off before they could pass through the road.
- One woman watched six 4-foot beings wearing metallic-looking suits walking around her field about 100 feet away for about 45 minutes. They were working near a landed saucer-shaped craft and each of them held a rod with an extremely bright light at the end.

Água

or

How I Came to Bless the Name Carlos Eduardo da Silva Oliveira

by Richard O. Giberson

I'm sitting at a table in a small café, in the Pinheiros district of São Paulo. Roses are in a vase. She should be here about 3:00 or 3:15. I'm early though, it's only 2:30. Since you asked, I'll explain how I ended up here.

First some background. About eight years ago, in the late nineties, I started a pharmaceutical research firm, called TerraPharming, Inc., with two colleagues – Dennis Morgan and Edie Chan. The idea was to cure all the world's ills by studying plants used for healing by indigenous primitive cultures and finding in them critical compounds to serve as the base for new drugs. Or, if we couldn't actually cure all the world's ills, we would at least get rich while trying.

Edie is brilliant in the lab. Dennis has a knack for business and a lot of contacts. That left me the de facto ethno-botanist. I had a Ph.D. in pharmacology and a subscription to National Geographic, so I suppose I was qualified.

Anyway, just over a year ago we finally “hit the home run ball”. I say “finally”. I know others that never do have the success we did, so I feel lucky. But when you put in seventy and eighty hour weeks over seven years, you say “finally!”

From a root found in the Costa Rican rain forests, we discovered a compound that significantly slows or reverses many of the effects of Alzheimer's. In fact, for early onset Alzheimer's, it may prove almost as good as a cure. When the early trial results were made public, our previously neglected stock skyrocketed. Shortly after, we signed a deal with a pharmaceutical giant to manufacture and distribute the drug. Their up front payments and the expected ongoing royalties were staggering.

Once things calmed down, Dennis, Edie and I decided we each needed some time away. Edie and her husband were expecting their first child, so she planned an extended maternity leave – something like five years, she threatened. Dennis said he was taking the whole summer off to spend with his family.

“I have really let a lot of things go undone with my family these last seven and a half years. I think I have some rebuilding to do,” he explained.

“So what do you have planned?” I asked.

“First a trip to Disneyworld and to the Gulf Coast. Then just Erin and I are going to Europe – sort of a second honeymoon. And both of the boys are in Little League now. I intend to actually be there to see them play.”

“Sounds like you have it all mapped out.”

“So, Marc, what about you?” Dennis asked.

“I don’t know,” I replied. “No real plans yet. I luckily don’t have the ‘rebuilding’ problem you have.”

“Maybe that’s exactly the problem you should address in your time off. Why don’t you find someone that can add a little meaning and purpose to your life?”

“Dennis? Meaning and purpose? We just developed a drug that will improve the lives of millions of people around the world, and you’re saying I need meaning and purpose?”

“What I mean is, it will add another dimension to your life. And besides, ‘it is more noble to give yourself completely to one individual, than to labor diligently for the salvation of the masses.’”

“Who said that?”

“I heard it years ago on a Stephen Covey book-on-tape. He was quoting someone – I don’t remember who,” Dennis answered.

I was silent. Dennis and I had had this friendly argument on marital status several times over the years, but I wasn’t in the mood to continue it then.

“Spend your time how you like, Marc. But just stay away from work! We’ve got a good staff to watch the store while we’re gone. And there will be plenty of time for us to discover the Fountain of Youth and the Cure for the Common Cold when we get back together in the fall.”

With that, Dennis left.

I actually did have some ideas for my time off. I thought I’d visit some family I hadn’t seen in years. That meant Rio de Janeiro. While my father was American, my mother was Brazilian. I had actually lived in Rio until my fourteenth birthday, when my family moved to New York. In the years since I finished college and moved to Atlanta, I had never been back to see all my aunts, uncles and cousins in Rio. I thought now was a good time.

Beyond that, my plans were sketchy. Luckily, I had the U-Searcher 3.0 personal search engine on my laptop computer. I decided a little time on the web would give me some ideas.

U-Searcher 3.0 is pretty incredible. While all the search engines can find “a needle in a haystack,” this one always seems to find just the particular needle you’re looking for. One overzealous software reviewer even went so far as to say that it “anticipates your needs, and even senses your innermost wants and desires, and takes steps to satisfy them.” That’s an exaggeration, but it is good.

So I typed into the search box:

Brasil AND.....

“And what?” I thought out loud. “Aha! Just to spite Dennis...”

Brasil AND (“Fountain of Youth” OR “Cure Common Cold”)

I clicked “Search.” In a few seconds it came back with just one find. That wasn’t unusual. It had a habit of tossing out all matches it considered irrelevant.

One more click of the mouse and I found myself on page one of a paper titled:

“A Study of Mortality and Morbidity Rates at São João do Morro Verde”

by Carlos Eduardo da Silva Oliveira (1942 – 1981)

published 1982, Universidade de São Paulo

It was slow reading. My Portuguese is fine for conversation, but unaccustomed to technical papers. Apparently, Professor Eduardo taught public health courses at USP. He was also a self-taught actuary. He spent much of his time researching and documenting health conditions and life expectancies in Brazil’s cities and towns, hoping to bring about improvements and encouraging changes in the state healthcare system. He was widely respected, that is until São João do Morro Verde.

São João is a small village in the state of Minas Gerais. You won’t find it on any map, but it is near the towns of Santa Fé de Minas and Cachoeira do Manteiga. It seems that Professor Eduardo discovered this place with unusually high life expectancies and incredibly low rates of disease. The locals ascribed it to the natural spring which fed the pool in the town square, or *praça*. The Professor became obsessed with this town and its spring, convinced that he had found a “fountain of youth”. For seven successive winters, he returned to São João. He was preparing to publish his findings when he met an untimely death. On the way back to São Paulo after that seventh winter at São João, he was killed in a car accident.

A graduate assistant at USP published his work, but it was largely ignored. Papers claiming to find a fountain of youth rarely receive serious academic attention, particularly those published posthumously. So it was filed away in some dusty library shelf, until recently when USP began digitizing everything in its libraries.

I’m not sure why – maybe I just trust my U-Searcher 3.0; maybe the whole thing was so far fetched that I couldn’t resist. For whatever reason, I felt compelled to see São João do Morro Verde for myself, and drink of that water. So my plans were made: two weeks in Rio, then a week and a half for my irrational expedition to São João.

* * *

On the evening of June 21st I found São João, tucked in rolling green hills scattered with small farms and orchards. In the *praça* was a small church, a *padaria* – serving as the

town bakery, restaurant, and bar – and a few other stores. On the east side by a stand of trees was a large pool with stone sides. Carved into the stone were these words from the book of St. John:

“A água que eu lhe der se fará nêle uma fonte d’água que salte para a vida eterna.”

Or, in English:

“The water that I shall give him shall be in him a well of water springing up into everlasting life.”

So this was the “famous” spring water of São João. Nothing looked too extraordinary about it. It would wait until tomorrow. I found a room to rent above the padaria, and settled in for the night.

The next day was Friday and, I found, the day for the big market in São João. The praça was filled with tables and tents, with fruits, vegetables, clothes, crafts, and the rest of the usual market goods. The crowd gave me the chance to quickly interview several people about the spring.

“So, do people in São João live longer, healthier lives than those in other towns nearby?” I would ask.

“Oh, yes,” they would reply.

“And why is that?”

“The water, of course.”

“You mean to say that it is the spring water that feeds this pool that makes you live longer and healthier?”

“Yes. *Fora de dúvida*. Without a doubt,” they asserted.

I had that same conversation dozens of times. The answer always the same: “*Fora de dúvida*.”

Around noon, I found the *padre*. It was the church’s meticulous records of births, deaths, and causes of death that had provided Professor Eduardo data to begin his study of São João. We talked about those records and about the Professor’s work of so many years ago. Then I asked him those same questions I asked in the market.

“The people of São João live longer, healthier lives than those in other towns around here?”

“Yes, and happier,” he replied.

“Professor Eduardo was convinced that the water from your spring was the source of this difference. Everyone I spoke to in the market this morning believed the same. And you, what do you think?”

“I don’t think I can answer that question to your satisfaction. If you want an answer from science, you should ask a scientist.”

“Well said. And if I want an answer from the padre?”

He pondered a moment, and then spoke deliberately:

“When we receive a divine gift, we should not ask ‘How?’. Neither should we say ‘Why?’. Instead, we should accept it with joy and with thanks.”

I spent the next couple of days thinking about those words while I enjoyed the peace and quiet of a small country town. Work and Atlanta seemed worlds away. Of course, I could pull the satellite-linked palm computer out of my bag and call work. Or check CNN or stock quotes or the scores from the Braves’ games. But I felt no desire for any of that.

And yes, I drank the water. It was good – but there was nothing to distinguish its taste from any other spring water I had had. Still, I prepared several vials for testing back at the lab.

Monday afternoon I was sitting in the shade not far from the pool. A car drove into the praça. A woman got out with a couple of bags. She paid the driver, who then quickly drove off.

Her clothes and bags were not those of a local. But she said a quick “hello” to the man at the padaria and then went directly to the pool. Cupping water in her hands she drank, and drank. The water ran down her chin and neck. She drank as though parched from a walk across the desert. Actually, that’s not the right description. She seemed to drink so intensely not for thirst, but rather due to some great passion or joy.

The scene was so odd. Here was this well-dressed woman in a dusty small town praça taking such joy in a drink from a simple spring-fed pool. I had to find out her story.

“Good water, isn’t it?” I asked.

She turned to face me, noticing me now for the first time.

“Yes, it is.”

I offered my hand, “Marco Anderson. Pleased to meet you.”

She hesitated, finally taking my hand and replying, “I’m Renata.”

“You don’t seem to be from around here. Did you come all this way just to drink the water?” I asked, half mocking. Likely not the best way for me to start a conversation, but that is what came out.

“I am from here, but it is obvious you are not. I did not come here just for the water, but to visit my mother. And you, Mr. Marco Anderson, why did you come all this way?”

I paused, realizing that I had in fact come here just for the water.

“The water,” I admitted.

She laughed, and then I laughed.

“This is just water, Mr. Anderson. I am sure they have water where you live as well.”

“Yes. But if it is ‘just water’, why did you drink it with such passion when you arrived?”

“I can’t explain it for you, I’ll not even try,” she answered. “But why do you come here inquiring about the water?”

“Research. I read a paper by a professor at USP about...”

She cut me off. “You read Professor Carlos Eduardo?”

“da Silva Oliveira. Yes,” I replied.

“I didn’t know anybody had read that paper, at least not in years.”

“But you have, it seems.”

“I’ve more than read his paper. I knew Professor Eduardo,” she replied.

“You seem too young, he died so many years ago.”

“He died when I was five, but he stayed with my family each winter he was in São João on research. My mother knew him well. So Marco, do you have dinner plans? Mother will cook for you. Anyone that has read Professor Eduardo and come in search of the water of São João should meet my mother.”

So I had dinner with Maria Renata da Costa and her mother, *Dona* Andreia. Then they pulled out an old photo album to show me photographs of Professor Eduardo.

“Is this him at your birthday party?” I asked.

“No, no. That is my father. It is my sixth birthday and Professor Eduardo died when I was five. Besides, my birthday is in April and the Professor was only in São João during the winters. Now here, this is Professor Eduardo,” Renata said turning to another page, and then another.

Renata had left this small town to study in São Paulo, and now was herself a professor at USP, teaching environmental sciences. Her memories and her mother’s stories of Professor Eduardo and his work had inspired her to think beyond São João, and her studies took her on a similar road of seeking to better the lives of ordinary people.

“These look like very happy days,” I said, as we finished the pictures of Professor Eduardo and Renata’s family.

“Those were the happiest days,” Dona Andreia replied softly. Then she excused herself to return to the kitchen.

“Where’s your father now?” I asked.

“He died a couple of years ago – an accident taking a cart of fruit over the hills to market at Santa Fé. He got caught in a terrible rainstorm, and there was a mudslide.”

“Oh, I’m sorry.”

“No, don’t be. It’s fine,” Renata replied.

We were quiet a few moments, then I spoke.

“So, back to my research. Tell me again about the water. Is there something to it?”

“That depends what you mean. I can tell you that I have tested the water in the lab myself and there is nothing peculiar about it. It is simply water,” Renata answered.

“And Professor Eduardo?”

“He was a dreamer. That’s not bad mind you, but that is what he was: a dreamer.”

“And all the people in town? Dreamers as well?”

“This is a small town far from the cities. The people are simple here. They believe there is something different about the water. There’s no reason to destroy their belief. It is doing them no harm to think as they do.”

“But I still don’t understand the way you drank that water when you arrived in town. You did not look like someone taking a simple drink of water. Yet you tell me it is just water, with no special significance.”

“It is water. But it is not without significance to me. I’ll tell you more. Not only do I drink the water with such passion when I return home, but I carry back with me several liters to drink in São Paulo. That is how significant this water is to me.”

I was still confused.

“I can see how the simple people of the town might get a sort of placebo benefit from the water, thinking it brought them better health and longer life. But you know otherwise. How can you possibly derive something from this water, different from any other?”

“Marco, you have it all wrong. The people here drink because they believe, falsely, that it contains some magical means of healing. I know it is simply water, and yet I drink as well. I believe I am the one more healed, more benefited.”

I sat thinking on what she said and unable to craft a response. I wanted to understand what she meant, but for now the meaning was lost on me. But I found myself amazed by her words and unable to pull away from her gaze.

“You don’t understand now. Perhaps one day you will.”

“Yes, not today. Can we try again tomorrow?”

Over the next couple of days before I left, I spent many hours with Renata. I soon found myself talking to her as you would to an old friend. And she seemed to understand me as only such a friend would. I, on the other hand, was still struggling to grasp who she was. Appreciate? Yes. Admire? Yes. But understand? No. Not any more than I understood her explanations about the water.

So as I prepared to leave São João, I had a lot of unanswered questions. Most of them started with “Why?” – as in: “Why does this water matter?”

As I put my bags in the car, I asked myself “Why did I come here in the first place?”

As I stared into Renata’s eyes, I asked myself “Why has she enchanted me so?”

And as she gave me a kiss goodbye, I had to ask myself “Why am I leaving?”

She sensed my unspoken questions. “Marco. When you are ready to comprehend the answers to your questions, come visit me in São Paulo – after classes restart.”

Back in Atlanta I tested the water. It was as Renata said, I found nothing unusual.

I tried to get back to my “prior life”. But with each day that passed, her image became more engraved on my mind. Her words haunted me.

Even the padre’s words replayed constantly in my mind: “When we receive a divine gift, we should not ask ‘How?’ or ‘Why?’. Instead we should accept it with joy and thanks.”

It was useless to pretend I was unchanged by the experiences of São João.

In August, I sent her an e-mail. We agreed to meet today at this café. So, here I am. That is my story.

* * *

My mind wanders while I wait: “What would it be like to live in São Paulo, work in Atlanta, and spend winters in São João?”

I hear the café door open. I look up to see that it is her, with her green eyes and her long dark hair. And she is smiling, *at me*.

Without a word, she pulls an unmarked bottle of water out of her bag and quickly fills two glasses on the table. We lift the glasses to her toast –

“To water, and to life!” she says.

I sit in wonder.

And in my mind I bless the name of Carlos Eduardo da Silva Oliveira.

Simple Solution

By Zahra E. Zahid

Copper rays of the late summer dusk streamed in through Al's office window. He was tired. It was late. But finally the last bit of the report was finished. Al shut down his PC and walked to the door. He opened it and peeped out. There was no one there except his secretary, who seemed safely absorbed in some lagging job. Al softly shut the door and crept back to his desk. He was going to treat himself. He opened his desk drawer and cautiously pulled out his cigarettes.

As he opened the window, a breath of warm, humid air enveloped him. He didn't mind. "Smoking is prohibited in office buildings," he thought, but surely he had earned a break? Settling on the window sill with a sneaky smile, he lit his cigarette.

"Excuse me.." Al jumped out of his skin. He flung the cigarette away and tried to walk casually to his desk.

"Yes?"

"There was a call from the Government Actuary's office. They apologize for this sudden change; they say that this year's report must take into account the drastic improvements in mortality discussed with them in the last meeting."

"But they did not mention that to me then. I have had no email from them mentioning that it must be part of the projections for this report! The report is due on Monday and it is Saturday evening!"

"They apologized," the secretary repeated himself in a very temperate voice. This reminded Al of a Government servant. He felt his secretary could just as easily come in one day and say that Al had been fired, in the same temperate voice.

Satisfied that he had conveyed that urgent message, and that Al didn't seem inclined to engage in conversation, the secretary left, closing the door behind him.

Al felt upset. It was a mixture of anger and exhaustion. If every pensioner lives to be 150 years old, costs will go through the ceiling! How am I going to explain the jump in my calculations to the board? It will look soooo ugly in the report! he thought. He took out his scribbling pad and started scribbling. He found that soothed him in times of stress. The same words kept going over and over in his mind, interest rates, salary escalation, pension increase, and so on.

"If I could cost the liabilities using very high interest rates, I could write a report that will at least save my face. But - No. No idiot could honestly project that such high rates of interest will hold for any length of time. Interest rates, compensation levels, demographic assumptions..." The words kept going in his head. Then it struck him, "Demographic

assumptions!" He almost shouted like the famous philosopher shouted "Eureka!" so many centuries ago.

He started making some calculations on his pad. "That's it! If the real rate of return is 2%, and employees work from age 25 to age 92, contributing 20% of their salaries per year of their working lives will be sufficient to pay pensions to them for the rest of their 150 years at 80% of final salaries!"

The report was a breeze. Al was happy.

Al flicked on the intercom. His secretary's voice answered, sounding very tired.

"You seem a bit under the weather; everything alright?" Al's voice sounded too happy to the secretary for comfort. "I have finished the report. Could you please send it off for me? And do take the rest of the day off." He added as a mean joke.

"Will that be all?" The secretary never displayed emotion.

"Just one thing more," Al said jubilantly, "Could you please bring me an ashtray?"

A Mortality Study
By
Sophia Dao

Alan was driving around the North Shore of Oahu in his new Toyota, whistling the same old tune that had been in his head all morning. In a normal day this would drive him out of his mind, but today he didn't care. He had never found himself so happy and carefree. He lowered his car windows and breathed the fresh air. The smell of the ocean, together with the tiny drops of water splashed up from the seashore, made him feel refreshed. Today was the first day of his two-week long vacation. He started out by driving around the island.

Alan lived in Honolulu. Even though he was surrounded by beaches and beautiful sceneries, Alan hardly saw anything beside his apartment and his office. He spent most of his day working as an actuary for a life insurance company. He spent the rest of his time cooping up in his studio in Waikiki. He used to be a study machine, as he called himself. He got his actuarial job right out of college and studied like crazy for seven long years. Now, at age thirty, he was a Fellow of the Society of Actuaries and was still trying to adapt to normal life.

He was in the West of Oahu now. There was hardly any traffic, and there were hardly any inhabitants in the area. All he could see were fields after fields of pineapples. It was getting dark. The sun had set half an hour ago. He was still about one hour drive from downtown Honolulu. Looking ahead he saw a man, with a beard, signaling for a ride. Alan hesitated. He didn't even want to drive with friends, let alone strangers. Besides, having lived in Hawaii most of his life, Alan had a queer distrust for people with a beard. Alan stopped the car anyway. After all, he had had a nice day, and he would like to show a little "Aloha spirit" to this stranger.

The stranger slipped quickly in, next to Alan, and mumbled some words of gratitude in a deep, low voice. He looked exceptionally neat, in spite of his beard. He was tall and slim, with his forehead sticking out. His deep, blue eyes were—although bright—remorseful. After a few minutes, Alan discovered that he was not much of a conversationalist, either. He introduced himself as Hans. He lived downtown and worked part-time as a German-English interpreter.

When Alan told him that he was an actuary, Hans didn't look surprised at all. He just nodded and mumbled "ah." This surprised Alan. He was used to getting all kinds of reaction to his personal introduction, but "ah" was not one of them. Whenever he was in a social gathering and people asked him what he did for a living, he knew that he was in for an elaborate explanation. And when he was through, people always gave him an I'm-sorry-I-asked look. Being with other actuaries did not give Alan a break, either. Every time he was at a Society of Actuaries' meeting, people often stared at him and said: "There are actuaries in Hawaii?" Hans's reaction—or rather, non-reaction—to his

introduction impressed Alan. He was either a well-educated man or a complete freak, although Alan was not sure of the difference.

The ride was fast and pleasant. The men exchanged words very little. Each followed his own thoughts and enjoyed the sceneries quietly. When they reached Chinatown, Hans asked Alan to drop him off at a crowded bus stop and disappeared quickly into the night. How could a neat, quiet man live in such a filthy, noisy neighborhood was the question of the moment. However, Alan quickly forgot about Hans and was happy to be home in his cozy studio again.

.....

It was Saturday, and Alan just realized that he needed a haircut. He took a bus to Chinatown. There was only one customer in the barbershop, so Alan was attended to right away. The barber lady talked stories to him endlessly, most of which he didn't bother to pay attention to. He was thinking how lucky the other customer was. He had the quiet barber. Neither of them talked. As the barber moved away to the right, Alan glanced at the mirror and recognized the other customer. It was Hans, the hitchhiker he met a month ago. Hans was looking at him at this instant too. He raised his hand in recognition.

When Hans finished, he walked over to Alan and greeted him.

"It's a small world, isn't it?" Said Alan.

"I'll say," said Hans with a dry smile. "Say, do you have any plan after this?"

"No, not really," said Alan.

"Why don't you stop by my place for a cup of coffee? I live nearby."

"Sure."

Hans lived in an old yellow walk-up apartment complex. His apartment was the first one on the third—highest—floor. As Hans went into the kitchen for coffee, Alan sat down on a worn-out, black leather sofa, facing the kitchen. Beside the sofas and a small table, there was nothing in the living room. Hans came back with the coffee and, as if he could read Alan's mind, explained that he was "old-fashioned." He has no TV, no VCR nor CD player. He lived on a modest income, which consisted of his monthly annuity income and the little money he made as an interpreter. That was another reason he lived in this neighborhood. The rent was cheap due to the high level of noise and crime.

"But, you see," said Hans, "noise and crime are not a problem for me. I have nothing that the criminals want, and I installed double-paned, argon-gas-filled windows in my apartment to filter out the noises."

Hans was quite talkative today, relatively speaking. As was the case for most hermits, they could shut up for days and became open and talkative when they found someone worth talking to, thought Alan.

“What do you do for fun?” Asked Alan.

“I have a computer,” said Hans.

“Play games?” Asked Alan.

Hans laughed. “No! Read news and work on projects.”

“What’s so fun about that!” thought Alan, trying to come up with a more polite response.

“I know,” said Hans, responding to Alan’s thought, “but my projects are interesting, to me at least.”

“What are they, may I ask?” Said Alan.

“They are part of a study that I haven’t come up with a name for yet,” said Hans slowly. Although his English was almost perfect, he seemed to be very cautious every time he spoke. “Do you know anything about Astrology? My study is similar in nature.”

“I’m a man of science,” said Alan, shaking his head. “Astrology doesn’t interest me.”

“Astrology, in its finest form, is a science,” said Hans.

“How so?”

“You are an actuary. You do actuarial modeling, is that right? Do you call that science?”

“Well, I admit that there is subjectivity in the modeling process,” said Alan. “But it follows some scientific method. We have data from the past, and project the future based on solid assumptions using sound mathematical models.”

“How solid are your assumptions?”

“They are solid in the sense of being carefully considered and tested time and time again. For example, when we project our company’s production and profitability for the next five years, we not only look at historical data but also other relevant factors such as the nature of our new products, the competitiveness of our commission rates, our competitors’ products, the economic outlook of our target markets, and you can go on and on. We also review and revise our assumptions as time goes by. Sure they are only assumptions, but they are quite reliable.”

“Right,” said Hans. “My so-called ‘life-model’ is similar in concepts.”

“Oh?”

“Have you heard of numerology? Yes, it’s the ancient science of foretelling. The chain of events that happen in your life can be ‘forecasted’ using a certain calculation method. I have developed my own science of foretelling, which is more advance.”

“Oh great! Another nut! There must be something in the air in this part of the town,” thought Alan, regretting his decision to come here.

“Can you elaborate?” asked Alan politely.

“The life model, like any model, needs existing data. In this case, the existing data includes a person’s birth time and location, his or her physical make-up (shape of the head, eyes, ears, voice, feet/height proportion, and whatnot). The more data you have, the more reliable your model is. But, of course, you know that.”

“I have a problem with your model here,” interrupted Alan. “Are you telling me that my fate are predetermined? I find that hard to accept.”

“It’s not the case,” replied Hans calmly. “When you forecast using your model, you start out with certain data and assumptions, but then things don’t happen exactly as planned, right? Similarly, you were born with a certain set of “luck,” but this changes frequently depending on the chain of events that happen in the universe every moment. Any model needs to be frequently updated with new data in order to be meaningful.”

“The problem I have here is: How can you model the whole universe? The actuarial models, or any scientific model, are narrow in scope. For example, I know with some degree of confidence that the outcome of my company’s profitability is affected by interest rate changes, management actions, underwriting practices, and so on. Even with all this, my model is still far from accurate, and it’s no cakewalk. It takes the most sophisticated software program and a bunch of dedicated people to build a model.”

“It’s hard, but not impossible,” said Hans. “We are not talking perfection, but approximation. I spent two years developing a program to do this. Needless to say, it’s far from being complete.”

“Are you serious?” Exclaimed Alan. “You have a computer program for this so-called ‘model’?”

“Yes, anything that follows logic can be programmed. The only problem is the means and the willingness to do it.”

“I didn’t know that you know computer programming.”

“I actually had a master degree in computer science. I used to work for a software company in California. Got kicked out because of this project.”

“I admit that your model sounds interesting and impressive,” said Alan. “However, I have to say that I see to practical purpose in it.”

“Typical!” Said Hans in a bitter tone. “The impractical are usually the most interesting. My model does have some practical values, if you need to know. In fact, it’s my extra source of income.”

“Oh? How so?” Asked Alan

“I use it to help some private detectives with their criminal investigations.”

“How?”

“Simple. In modeling, predicting the future is challenging, but explaining the past is somewhat easier. My life model can reconstruct a crime scene and lead to the criminals. My clients don’t know about the model. They just pay me for the leads I give them.”

Alan was not sure what to think about this man. He was a lunatic alright, but a lunatic with reason and a very vivid imagination. Alan found him refreshing. He was not afraid to sound stupid.

Alan didn’t see much of Hans since then, but they kept in touch through e-mail. Hans’s e-mails were, for the most part, about his weird “projects” and crime stories, but Alan liked them anyway. They were, to him, like a series of entertaining, well-written fictions.

.....

It was Friday night, and Alan was working late. He was working on a mortality study project. This was the first time his company did the study, so he had to set up everything from scratch. As he went through the data, he noticed that there were only seventeen deaths last year, but the total claim amount was more than three million dollars. His company usually didn’t sell a lot of large-sized policies. He found out that there was one policy with the face amount of two million dollars. The name was “Anthony Kim.” The cause of death was “UN”—unknown. Alan remembered that name. It was part of a high-profiled death case that dominated the local news for quite some time. He searched the Internet and found a bunch of articles about Anthony Kim. He was the late President and CEO of Pacific Bank—one of the largest local banks. He was found death in his office couch on October 28, 2005 (about two months ago). Around seven o’clock that night, the cleaning staff found him stiff and cold on his favorite couch—where he sat and worked every night. He was probably dead about an hour earlier. The police and coroners did extensive research on the cause of death, but they remained unsuccessful. There were no foul play reported, no sign of violence or poison in his body. He seemed to die pretty quickly—no sign of any struggling. The only possible explanation for the

cause of death was heart attack. However, he had no history of heart problems, as his doctors testified.

Alan couldn't sleep that night. In the morning he was restless. He made himself a cup of coffee and sat down on his couch, facing the TV. He reached the remote and turned on the TV for the 6 o'clock morning news. The thought of Mr. Kim's mysterious death flashed through his mind. Mr. Kim died in his couch, probably in the exact position he was in now. "Why? Why is it that the cause of death was not known, given the advanced level of modern technology? Was there any supernatural force involved?" Alan dismissed that last thought immediately. He thought of Hans—the man with the incredulous "life" model. Would Hans be able to shed some light to this darkness? It would be worth a try. After all, Alan had wanted to check him out. If Hans's model didn't work, then he would stop talking nonsense and give "real" science some respect.

Hans seemed to be glad to see Alan. His face brightened up when Alan inquired about the life model. He showed Alan to a small but tidy room. There were bookshelves on all four walls. In the right corner stood a black, wooden desk with a computer on it. Hans turned on the computer and opened a file.

"This is a typical file for death cases," said Hans. "You just need to enter new data and run it. The most important thing is accurate and detailed information about the case at hand. What do you know about this case?"

"All I know is what I read from the news," said Alan. "I also know that he had a term insurance policy with us for two million dollars, and he smoked."

"Let's see," said Hans, searching the Internet. "He switched back and forth from the news articles to his model and entering all kinds of information. Alan could see why he entered date of birth, place of birth, date and time of death, place of death, family and work information. However, he didn't see why information such as the shape of Mr. Kim's nose, the food he ate, or the color of his car had anything to do with his death. However, he remained quiet, since Hans was deep in his work.

They spent the whole morning gathering data. Hans even made a few phone calls to his detective friends to inquire about the case. It was one o'clock in the afternoon. Hans said that the model was ready to run, and it would take two hours to run. They went to a nearby restaurant to have lunch. When they came back, the run was complete. Hans rubbed his hands together.

"Now is the moment of truth," said he.

They both sat down. Hans clicked on the "Report" button and checked some parameters. Then he clicked "Show."

Slowly and steadily, the screen was forming some sort of a picture. While they were waiting, Hans explained:

“I chose the hours between 3 and 7 o’clock on the night of his death, October 28. This report will show what happened then. Of course it’s only a good guess, but it would give us some ideas.”

Now the computer screen had stopped moving. They saw in front of them a blurry picture of an office, a desk, one chair behind the desk and four chairs in front of it. A man, presumably Mr. Kim, was sitting behind the desk. There was a couch to the left of the desk and facing it, next to the couch is a small table with some notepads and writing instruments. It said “Friday, October 28, 2005, 3:00 PM” on the upper-right-hand corner of the screen.

“The picture is very bared of details,” said Hans. “The model can only produce what we put into it. It doesn’t matter, though, since we only need the essential. The way this works is, every picture is different. If there is no change, there is no new picture.”

He clicked on the forward arrow at the bottom of the screen. The next picture showed Mr. Kim walked towards the couch and sat down. He sprung on his feet instantly, and then collapsed again. It was 5:47 PM.

“Oh my God!” Whispered Alan.

“Interesting, interesting,” said Hans quietly.

“I think something on the couch killed him,” said Alan, feeling shaky.

“Or rather, something *in* the couch,” replied Hans.

“What do you mean?”

“Mr. Kim, from what we have heard about him, was a very sharp and observant man. Do you think he would miss an object sitting on his couch? Did you notice from the previous pictures that he actually looked at the couch before sitting down? There ought to be something hidden inside the cushion, something small and deadly. Who...”

Hans quickly grabbed the mouse, went back to the report screen and checked on certain options.

“I’m going back a day earlier,” explained Hans.

It was Thursday, October 27, 2005, 3:00 PM. The office, the desk with Mr. Kim sitting behind it, the couch, and everything was as much the same as the day after. Hans kept clicking the forward arrow. At 5:40 Mr. Kim walked towards the couch, sat down, and started writing on his notepad. Later, at 6:05 PM, came another man, who acted like his assistant. They talked for six minutes, and then Mr. Kim left. The other man sat on the couch and looked at what Mr. Kim had written. However, at about half a minute later, he

stood up and looked stealthily around. He walked to the window, looked out, then walked to the door and closed it.

Alan was breathless. He glanced at Hans. Hans looked calm but intense. He stared unblinkingly at the screen. His right hand held fast to the mouse, and his left hand was grabbing his square chin. The next few pictures showed that the man put gloves on his hand, lifted the cushion, opened its side zipper. Then he took out a small, squared box from his pant pocket. He opened the box and carefully, using his thumb and index finger, took out an object that looked like a spring with a sharp end and carefully planted it deep into the cushion. He then closed the zipper and put the cushion back, turned off the light, and left, closing the door behind him.

“And that was how our man died,” said Hans quietly, without moving.

“I don’t understand,” said Alan. “I suppose that the spring contained poison. Why didn’t the police discover the spring? And why didn’t the autopsy reveal the poisonous substance? Strange!”

“It’s not so strange,” said Hans. “The couch, as one may deduct, was very soft and puffy. Its elasticity was high. When Mr. Kim, who weighed more than 200 pounds, sat down, the spring instantly stung him. However, when the police removed his body, I don’t think they could have seen the spring. It must still be buried in that cushion. Too bad the model didn’t produce enough details on this man’s method of securing the spring, but we could guess that it was a masterly performance.”

“What about the poison? How come they didn’t know about the poison?” Interrupted Alan impatiently.

“Ah, the poison,” said Hans. “Modern medical technology does not know everything. I recently heard of a kind of poisonous plant called Ono from the Big Island. Its poisonous substance went undetected in the lab. There are many of such things out there. I believe this man here possessed one of those poisons.”

“I have one more question,” said Alan. “What was the motive of this man? What could he possibly get from his boss’s death?”

“I don’t know,” said Hans. “We can find out more about him from the model if we update it. On the other hand, certain things are better left undiscovered. For now, it suffices to say that vengeance might be the motive. His boss might have done something bad to him, or threatened to fire him. Let’s stop here.”

“You are not going to tell the police about the couch and the spring?”

“Why? On what pretext should I tell them? What good would it do? The couch is harmless now, and nobody would believe me anyway. The world is not ready for my model yet.”

“Maybe you can explain more of your model to me sometime,” said Alan with some eagerness.

“Anytime, anytime you are ready,” said Hans. “Say, do you have any plan for tonight? If not, you and I can go out and celebrate New Year Eve.”

“Why don’t you come out to Waikiki tonight? We can watch firework near the beach, and get drunk afterward.”

“Sounds like a good plan,” said Hans, as he walked Alan out of his apartment.

The Great Actuary and Underwriter

Sarah L. M. Christiansen

It was September 10, 2401 in Spring Hill at the ABC Life Insurance Company on Planet Earth. The actuaries were attending a departmental meeting to review the results of the latest experience studies. Francine said, "We have some peculiar results here. We have a small enclave of policyholders that is more than two standard deviations from the norms." Matt, the chief actuary asked her to elaborate. "Their death rates are 4.5 standard deviations below the life insurance tables and the annuity tables." Matt asked for more information and Francine said "The tables are the smoothed, galaxy-wide tables, but all of the other policy holders are within a standard deviation."

"We must find the secret to their longevity. How can we tell from the applications which come in from all over the galaxy, whether the applicant belongs to this group, when it is illegal to request addresses or group memberships on applications? We only get the address after the policy is delivered via email." Matt enquired "Is this impacting our profitability, since the group is small and we cover so many people all over the universe?" "Well, not yet", replied Francine. "What else do we know about this enclave?" enquired Donald quietly.

"We know that they are very quiet, do not bother others, and that they buy insurance policies to cover accidents and they annuitize at age 100. We have found that for those who move out of the area, the mortality of those who leave is comparable to that of our other policyholders." replied Francine.

"That is certainly strange, since those who leave should have the same genetic makeup of those who stay. Maybe we could send an investigator to learn what it is that they are doing differently from the others in the universe," suggested Colin from the Moon branch, who participates by webcast. "Just where is this enclave?" "Not far from our home office in Peaceful City" replied Nancy, Francine's assistant. "Before we send someone over there, perhaps we should check on the computer to see if there is anything unusual about those who live in Peaceful City" added George, the computer guru of the department. "Well, it isn't all of Peaceful City, just an old, rundown and crowded section based on the addresses" Nancy said. "What did the computer turn up about it?" Matt inquired. George consulted the results of the computer search. "Absolutely nothing other than it has been the historic home of an ancient people that disappeared after 2050." "So it is decided then, that we will send someone out there?" said Matt. The conclusion from the webcast meeting, which also included all of the actuaries except for Yitz, who was on vacation, was to send someone out there.

September 24, 2401, at the next departmental meeting, Matt requests an update on the group with the abnormal mortality. "We sent an investigator to Peaceful City. He was there on September 11th and 19th. He found the area, but there was no one anywhere to be seen, and he was reduced to asking in the surrounding areas. All he learned was that most of the people followed some strange customs that their neighbors did not understand. They did not interact socially with the people in the surrounding area. They always lit candles at sunset on Friday nights and had a nice meal on large table covered with a white tablecloth. It appeared that the people did normal things the rest of the week but between Friday evenings and after dark on Saturday, they took time for their family,

dressed up and walked everywhere. No one in the surrounding area understood why they would not use their personal transporters at that time. But while he was there, he found a scrap of paper with some printing in an extinct language. He barely had time to photograph it when a breeze blew it back into an open window in the enclave” reported Nancy.

“Paper? We haven’t had anything on paper for the last 100 years”, remarked Matt. “It must be priceless! Too bad it was blown away. May I see the photo?” “Well, we have sent it around to all of the language experts at the major universities on this planet. First we tried to paste the photo into BabelFish.com to get a less expensive on line translation, but BabelFish and the other on-line translation sites could not recognize it. We are awaiting a translation, but you can study it while we wait (See Figure 1).”

Francine replied. Everyone looked at it, thoroughly confused.

“May I interrupt”, said Pam, the secretary, “you just had a message delivered from the Classical Studies department at University on the mountain near Peaceful City.” Francine checked her wristwatch computer, which slowly scrolled a message. We have a translation coming in now. The translation reads:

On head of the year it will be written, and on judgment day it will be sealed, how many shall die and how many will be born; who shall live and who shall die; who shall come to a timely end and who to an untimely end, who by fire and who by water, who by sword and who by beast, who by hunger and who by thirst, who by earthquake and who by...ⁱ

Sam said, “Wait a minute, if it is known how many will be born and how many will die, and who at what age, then we NEED these data. Plus we could go into the casualty business as well, if we were to know where there would be fires and earthquakes. What a competitive advantage, we would have if we could get it. Where is it written?” John commented “We won’t need underwriters, either, all we need is access to the data, and that would cut our costs and increase our profitability, think of our bonuses”.

“Start the search engines on ‘head of the year’!” Everyone raced to their computers and all that they got were 97 varied references. The results included a coffee table books on the photographs of heads, year books for otolaryngology, reports of the condition of a disability one year after a head injury, a news report of a NJ boy shot in the head by his 8 year old brother, a Stephen Morse story about the rebirth of a frozen head in the year 2240 (available at Walmart), and one strange reference to the birthday of the world. They understood the other results (and some were clearly not what they desired), so they tried ‘birthday of the world’ next. However, this time all that they got were references to birthday traditions around the world, music, a birthday website and 135 references to the big bang and a lot of high level physics and astronomy. George said, “Let’s try birthday and world without the quotes.” “Well, we are getting 5 million hits and the first 300 are all genealogical references” a frustrated Francine remarked. “And if we just try birthday we 12 million hits, and the first 200 are various Hallmark stores and anybirthday.com. If we just try world we get 10 million hits, mostly maps and physics and geology,” added Nancy.

Francine said, “I noticed that there was an ellipsis, as if the translators could not get everything. And I do not understand the judgment day comment. That sounds like it

is something that happens after one dies, but every year must have a head (if any year does).” Donald chimed in; “this was a photo of a piece of paper? A scrap? Maybe a couple of us should go back to Peaceful City and see what we can learn.” “ But anyway, how would that give these people a much longer life than the rest of the population? We really need is to find the data. Let’s forget about the city and the enclave, but concentrate our efforts on finding the data” said Matt as the meeting adjourned.

They all set their computers to looking for the extraordinary data, since it was much less expensive to use the computers than to send someone to Peaceful City, and besides the investigator who went to there has already charged us a year’s profit and found nothing other than the paper (and the translation cost was not small either, as Classicists are grossly underpaid). Since no one had anything to report, the next couple of departmental web casts were canceled. Finally, they decided that they had to hold another meeting. On the 3rd of December, yet another webcast was called. All of the actuaries in the galaxy participated, except Nancy who was on vacation.

Matt called the meeting to order and asked if there had been any progress on finding this fabulous data source. No one reported any progress, then Yitz enquired “What are we looking for, and why?” Francine summarized the results of the last two meetings. “How come you were not at either meeting?” she asked. “They were scheduled without checking my vacation calendar,” Yitz replied, “you recall that I mentioned that there were some days that I must take off and have no choice in, and these days tend to fall in September to October and March to April”. “And these were two of those days”. Matt asked, “How much have we spent on this search so far?” “Well our inter-galactic Internet bill is about a trillion dollars so far” replied Pam. “Do you think that we will have anything to show for it?” asked Donald. Yitz requested a copy of the translation. Paul commented that it did not appear as if they were going to be successful, and the cost of this small enclave’s abnormal mortality, did not appear to justify the huge expenditure. Colin and Matt replied simultaneously “It is not the mortality of this group, but the tremendous potential for huge earnings down the road, if we can get at these data”. By now, Yitz had studied the translation and commented “ Is it ethical to get these data, and not share it with the other companies in the galaxy? Also if we were to get the data, did you consider that actuaries would be unnecessary as well as underwriters? This whole company could be run, just by comparing the policyholder name to the database!” The others thought about that for a while. Yitz mentioned that he had to leave as the President of the Mars branch of ABT had just arrived in his office. The others pondered Yitz’s ethical questions for a while. The consensus of opinion was that it would be acceptable not to share the information with the other companies, since they did not share in the expense of the search. However, they were somewhat subdued by the thought that actuaries might be superfluous. They tried to weigh the cost of the search against their huge bonuses if they could obtain the data. They also wondered what relationship, if any, there was between this data and the average life span of 350+ years, compared to the usual 150 years. They decided to continue to search for the data. They started using all of the search engines available simultaneously, much the way that the prime number search was being conducted in the twentieth and early twenty-first century. Their conclusion was that their stockholders would reward them handsomely for the information, and the meeting adjourned.

The next meeting was scheduled for Thursday March 1, 2401 and all of the actuaries were in attendance at the webcast. The first order of business was the elusive data. Pam, who had the budget responsibilities, reported that the computer bill was now up to 3 trillion dollars and growing rapidly. "Do we want to cut off the computer search?" she asked. Yitz inquired as to what people thought about the ethical issues. Matt replied "We have a fiduciary duty to the stockholders as well".

Yitz continued, "May I see the photograph?" It was displayed on his computer on Mars, about forty seconds later. Yitz took a few minutes to study the photograph, including rotating it 180° on his computer. "We have a fiduciary duty to our investors not to waste money on a wild goose chase!" A long discussion took place about the merits of the investors versus the solvency of the company, if money were being poured down a rat-hole. Finally Donald thought a minute and said "Yitz, why do you think that this is a wild-goose chase?"

"Because I am familiar with this quotation, and I know that no computer will ever have access to the data. The place where the data is written is a 'book' and it is only open for ten days a year." But by the time that he said that, a meteor shower ended all of the communication with Mars. The rest of the staff was very frustrated with the timing of the meteor shower. Finally Patty said, "If the book is only open during ten days, how likely is it that one of those days was the day that we found the scrap of paper?" "If that is so, perhaps we should be looking for the data between the 10th and the 19th of September this year" replied Francine. Everyone agreed to this plan and the rest of the agenda was quickly finished.

The next few meetings of the department were uneventful, as no searches were attempted. The next webcast was set for Monday October 7, 2402 and Yitz was again on vacation. The report was again negative, and the cost was now 3.5 trillion for the computer search. The department decided to send a different investigator back out to Peaceful City. Since the group had not told the investigator about the weekends he went out the following two weekends.

The next webcast was set for Tuesday, October 22, 2402. The first item on the agenda was the report from the new investigator. He reported seeing people walking and playing with their children and dancing in the street on Saturday October 19th. But he did not see anything other than this that might give these people a much longer lifespan than normal. "Perhaps it is the exercise, that gives them a long lifespan", commented Patty. "But the galaxy's best athletes do not have the same lifespan and they exercise more" replied Paul, the athletic actuary. Finally Matt remembered that Yitz had made a comment about the 'book' only being open for ten days.

"Yitz", said Matt, "You were telling us about this 'book' only being open for ten days, when you were cut off with a meteor shower. What else do you know about this, and why do you consider this to be a wild goose chase?"

Yitz replied " In addition to the 'book' only being available during the ten days, the data can be changed during those ten days, so it must be full of erasures." George interrupted, "Does this mean that we could have data quality problems?" "Absolutely" Yitz said and he continued "And no one can see any of the data, and each person can only impact his or her own destiny." Matt practically shouted, "What do you mean, changed?" Yitz calmly replied "You are missing the end of the quote". Donald, who had sat quietly until now asked "Does the ability to change the data, have anything to do with

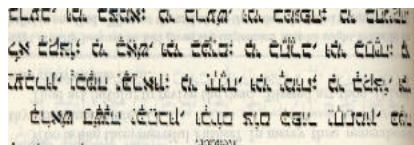
the unusual mortality that we are seeing?” Yitz replied very softly “The people in Peaceful City believe that it does”.

Francine asked, “What is the age of the quote”. Yitz replied “about 1400 years.” Colin inquired as to the title. “It is U’saneh Tokev” replied Yitz, but no one on Earth knew how to spell that, and the search engines came up with no results. Francine inquired, “Do you know the name of the author?” The first part of Yitz’s response was garbled, but Amnon of Mainz came through clearly enough. Patty tried to ask Yitz, what his connection is with Peaceful City, since he lives on Mars, but the connection was broken already, and so the meeting adjourned.

After checking with google (the actuary’s favorite search engine), each actuary found the end of the quote in a website devoted to the ‘extinct’ ethnic group, along with a horrible gory story (and you can too - just put ‘Amnon of Mainz’ into a google search and choose the 3rd or 5th reference, read the story and find the end of the quote). They decided perhaps that the “database” was a mirage, and that perhaps this ancient people that historians had declared extinct in 2050, actually survived in some small enclaves.

However the reference to the birthday of the world implied that it was not only the members of the ‘extinct’ group that were being judged and given an opportunity to change one’s behavior during the ten days, but everyone. If the data is a mirage, then why would changing one’s behavior prolong one’s life? And if the small enclave of long-lived people truly believed and behaved according to the dictates of the quote, then how could the data be a mirage? And of course, what connection does Yitz have with Peaceful City and this mysterious enclave and the quote? Is there a relationship between his vacations and the ‘Birthday of the World’ or the ‘Day of Judgment’? You decide. In the meantime, they decided that it was very important to check with Yitz to see if he could make future meetings before they spent even more money.

Figure 1: The original photo:



ⁱ Translation by Philip Birnbaum..

1+1=0
By Jerry Tuttle

(The events and persons in this story are fictional. Any resemblance to real people is purely unintentional.)

The miniskirted waitress brought two more beers to the table. She leaned over as she placed each beer bottle on the table, inviting the two male patrons a teasing look down the top of her blouse. She flipped her blonde hair, batted her long eyelashes, and flashed a big smile through her shiny red lipstick. Each of these gestures was designed to elicit a greater than average tip from the two considerably drunk young men. She did not understand that the two men were actuaries who could easily estimate a 15% tip to within a couple of pennies, no matter how drunk or distracted they were.

“To my fellow Fellow,” toasted Stanley Wu to his friend Ed Kochowski, surveying the long row of empty beer bottles, and clearly pleased with himself for what he thought was a clever toast. Ed clinked beer bottles with his old friend. Ed and Stanley had just gotten their actuarial exam results, and with this, their final exam, they would be inducted as Fellows at the next Society meeting.

“It has certainly been a long road to Fellowship,” mused Ed. “Partial exams, new exam structures, transition rules, nation specific exams. So many boring books and articles to read for each exam. Plus no matter how much they think they ask thoughtful questions, there were always those damned trivia questions. These should have been the best years of our lives - in our twenties, single, making good money - and instead we spent these years studying for the exams.”

“I think the Society owes us, big time,” Stanley replied. “The Fellowship bonus our company pays us does not make up for what the Society put us through. I want to find some way of really being a pain in the ass to the Society.”

“So what do you want to do?” Ed asked. “Hack into the Society’s computer?”

“I think that’s been done before,” Stanley said. “Do you remember a couple of years ago someone did that and switched all the exam results around? It took them months to resolve all the student complaints. That was pretty funny - until we realized it affected our exams too.”

“Well, I don’t really want to do anything that messes things up for other students. But it would be sort of fun to play with their heads at the Society,” Ed said. “Let’s see. What do we do best?”

“That’s easy,” Stanley replied. “What we do best is take actuarial exams.”

“Hmm. What do you say we take them all over again?” asked Ed with a sly smile.

“Why on earth would we want to subject ourselves to that torture?” asked Stanley.

“It wouldn’t exactly be US taking the exams. What if we take the exams under a phony name?” asked Ed.

“A phony name? Isn’t that called Identity Theft? That must be illegal.”

“How can it be illegal? Exactly whose identity would we be stealing?”

“Good question. Taking the exams again is so ridiculous that it almost makes sense! What if you and I each use the same phony name, and we alternate - you take the spring exams and I take the fall exams?”

“Great! What name should we use?”

“I don’t know. What’s your favorite number?”

“e to the pi i. Oh, you mean my favorite non-negative integer? Then you should have said so. Zero.” Ed wrote down a zero on a napkin. He stared at it. He rotated it ninety degrees, then another ninety. Of course, it still looked like a zero.

Stanley took the napkin. He wrote in letters Z-E-R-O under the zero. He rotated it ninety degrees. Then he rotated it another ninety. “Look,” he said excitedly. “There’s our phony name!” The letters were upside-down and reversed, but the spelling was clear: O-R-E-Z.

Ed read the letters aloud. “Orez,” he said. “It almost sounds Spanish, but I don’t think it is. How about Joe Orez? After all, Joe really is nothing.”

Stanley raised his beer bottle. “Another toast,” he announced. “To the birth of a new actuary, soon to be a Fellow. To Joe Orez.”

Ed and Stanley clinked their bottles and took a drink. They noticed a couple of attractive women at the bar. “What do you think, Ed - should we offer to buy them drinks?”

“Nah,” replied Ed thoughtfully. “After all, we may be Fellows, but we’re still nerds.”

Ed and Stanley left the bar and began making plans to fabricate Joe Orez. They decided they would each need a picture ID to get into an exam center. Joe would need an

employer, and it had to be one nobody had ever heard of. They quickly listed off other things they would need.

The next day after work, they practiced a Joe Orez signature until they could both do it identically. They changed into black shirts with black ties, they each slicked their dark hair back with gel in a decades old style, and they put on black sunglasses. They went into a stationery store that sold passport photos, paid fifteen dollars each, and had their photos taken and laminated onto official looking IDs.



The clerk didn't blanch as both Ed and Stanley signed their new ID as Joe Orez. Behind the black sunglasses they looked pretty similar, and they both had deep voices that even sounded similar. They had decided on a company name for the ID cards - Stanton Consulting - a partnership, that unlike a corporation did not have to be registered and would therefore be hard to trace. Over the next few days, Stanton Consulting got a post office box, a cell phone with a recorded message, a company credit card, an e-mail address and a web page.

<http://www.stantonconsulting.us>

They agreed on a few ground rules. They would use one of those free online calendars that the Internet companies were always pushing, to post which of them were going to be Joe each day. If Joe appeared in public, he would only wear all black, including the sunglasses, with slicked-back hair. As long as there was no chance they could inadvertently both be Joe simultaneously, Joe could send e-mails, answer the phone, attend actuarial meetings, and do everything any other actuary could do.

Joe registered for the first two actuarial exams. He registered online, and he paid with the company credit card. Ed helped Stanley study by preparing comprehensive study notes. They figured by working together, they could cut the study time by about two-thirds. Stanley and Ed were not particularly well-known actuaries, but now they were afraid someone might recognize them when they showed up for an exam. So although Joe

registered to take the exams in New York City, where both Stanley and Ed worked, they decided to change the registration at the last possible moment to Buffalo, where no one knew them, claiming there was an emergency business trip. Stanley as Joe Orez showed up for the exams in Buffalo, presented his picture ID at the door, and took the exams without anyone being the wiser. Six weeks later, Joe Orez's candidate number appeared on the list for passing both exams.

Joe continued signing up for exams two at a time, with Ed and Stanley alternating every six months on who actually appeared for the exam. Joe passed every exam he took, and undoubtedly people noticed his name on the pass list multiple times for each sitting.

Meanwhile Ed and Stanley decided to start taking Joe public. Joe signed up for the online Society and Rebel Outpost discussion forums, and he started posting comments. Joe would critique each exam he took, and he would also comment on rating and reserving practices, current events, ethics, and whatever else touched his imagination. If someone wanted to discuss the quantity and size of shrimp at the Society convention cocktail hour, Joe was ready with a comment. His comments were usually well thought out, and he seemed to have a greater knowledge of actuarial practices than someone still taking exams would normally have. But his comments also had a slight nasty tone to them, and they often generated some spirited discussion.

Joe also showed up for some out-of-town actuarial club meetings. In his unconventional outfit, he always attracted some attention. He would be sure to ask a question during the discussion period, always stating his name. However, he would not stay and mingle at the cocktail party afterwards.

It didn't take long at this rate for Joe to pass his last exam and become a Fellow. In fact, since Joe's date of birth had been manufactured, he became one of the youngest fellows ever. Joe registered for the annual Society meeting, proudly wore his name badge, and got his Fellowship diploma. He duly posed for pictures with the other new Fellows, but refused to remove his sunglasses. He flinched intentionally when the photos were taken, so none of the official Society group photos captured him very clearly. He didn't mingle much at this meeting, where he thought the chances were greater that he would run into someone from New York who would know him.

As a new Fellow, Joe was recruited for Society committee assignments. He only joined committees where he could participate by teleconference rather than in person. He joined an exam committee with the condition that he not be expected to attend meetings, as his employer did not reimburse those expenses. He dutifully graded his assigned exams at home and conferred with his grading partners by telephone. He joined several other committees with the same condition, and he always participated fully. Every committee chairperson gave Joe high ratings, and they recommended him for higher-level positions up the committee hierarchy.

Occasionally Joe would get a telephone call. Ed and Stanley had bought a cell phone with minimal monthly minutes, and had put a recorded message on it that answered with the name of Stanton Consulting. There was a menu with a choice of employees, none of whom could answer the phone right now, but please leave a message and they would call you back. When someone left a message for Joe, Ed and Stanley would figure out which of them should answer it, and one of them did. They did the same with incoming e-mails. They were careful not to schedule two different teleconferences for the same day. They used one of those European e-mail anonymizer services so that even if they both sent e-mails on the same day, the anonymizer would disguise the fact that the e-mails came from two different computers, making this fact impossible to trace.

Joe started becoming famous, at least in actuarial circles. He wrote study notes, he participated on twice as many committees as the average actuary, and he was an outspoken critic in the online discussion forums for everything: the way the exams are administered, the quality of speakers at Society meetings, the Society election process, and some common actuarial techniques whose theoretical bases were a little weak. He politely declined invitations to speak at panel presentations, but otherwise Joe had become popular and one of the better-known younger Society members.

Well, Joe was popular with the masses, but he was not quite so popular with the Society staff and with the elected board of directors. To them, Joe seemed to be constantly criticizing them. Unbeknownst to Ed and Stanley, the Society staff and board were getting tired of Joe's unending criticisms. Joe was the topic of a board meeting, when everyone realized the strangest thing - everyone had heard of Joe, of course. But as well-known as Joe was, nobody on the board could remember ever meeting him.

The Society staff pulled up Joe's file. He had passed all the exams, including the Professionalism course. He had attended the annual meeting where he was inducted as a Fellow, and he was included in the group photo of the new Fellows, although he was pretty unrecognizable behind his dark glasses. He had served on numerous actuarial committees, paid his dues on time with a valid credit card, and had written numerous formal and informal documents. However, he never attended any more actuarial conventions, including the ones where he should have attended to present his papers.

"Why don't we just call him, and invite him to appear at the next board meeting?" someone asked. "In fact, let's tell him we want to give him a plaque in recognition of his many contributions to the Society. Then when he shows up, we'll tell him to stop his countless criticisms of us, or else."

President Damien Brady agreed to make the call personally, right in the middle of the board meeting. As expected, Joe did not pick up the phone, so Damien had to leave a voice mail message. Not thirty minutes later, Damien got a call on his cell phone. Joe thanked Damien for the honor, told him it was a great privilege to make a few minor contributions to the Society, but Stanton Consulting discouraged such trips. Damien suggested the Society would pay Joe's expenses, and he could speak to Joe's boss if it

would help. Joe replied that his own personal modesty suggested such a trip was unnecessary, and Joe quickly but firmly declined and hung up.

The board was now more mystified than ever. Although Joe seemed to thrive on the publicity his criticisms generated, he would not even appear at a little board meeting to pick up a plaque.

Damien decided that it was just too strange that nobody had ever met Joe Orez, and some members of the board half-jokingly questioned whether Joe really existed. For someone with Joe's numerous actuarial accomplishments, such a thing seemed ridiculous. After considerable discussion, it was moved and seconded in a motion that was not to be recorded that Damien authorize \$1,000 to pay for someone to prove once and for all whether Joe Orez really exists. The board knew it could not afford a licensed private investigator for \$1,000, but they thought another actuary could solve this problem cheaper and quicker. Damien suggested his old college buddy and fellow actuary, Rafael Gonzalez.

Damien chose Rafael for several reasons. Rafael was a well-respected Fellow, but quiet and probably not well known among the younger actuaries. He worked in New York City, as did Joe. Plus, Rafael was somewhat of a mystery buff, having actually entered the Society's actuarial fiction contest with an original mystery story a few years back.

Rafael was certainly surprised to get such an unusual request, but it piqued his curiosity and he accepted. The first thing he did was dial Information, but there was no telephone listing for a Joe or Joseph Orez, either listed or unlisted, in New York, New Jersey or Connecticut. He pulled up the Stanton Consulting web site and confirmed that Joe's business phone on the web site agreed with his listing in the Society yearbook. He did a search to see who had registered the company web site, and that name agreed with the name of an IT employee on the site. Rafael wondered if he could just show up at Joe's office and surprise him, but Stanton had a post office box with no street address. He tried a different approach; he fired off an e-mail to the president, Roger Stanton, asking for a meeting to discuss a potential consulting assignment. Soon afterwards Roger replied, thanking Rafael for his interest in Stanton Consulting, but regretfully declining because Stanton only has a limited staff and was not accepting new projects right now.

Rafael gathered a collection of Joe Orez's bulletin board postings. He studied them, but he could not come up with any reason why they might be particularly unusual. He decided for fun to forward them to Judy Maguire, an English professor friend of his. At first Judy did not find them unusual either, although she commented that Joe obviously has a highly narcissistic personality. However, a week later, she e-mailed Rafael to tell him she had made a surprising discovery. Judy had run the e-mails through a computer program designed to test authorship. Similar to the tools used to test whether Francis Bacon or someone else wrote some of Shakespeare's plays, Judy concluded that due to

the frequency of Joe's word patterns, the probability was high that more than one person wrote the Joe e-mails.

Judy had a couple more scholarly tidbits: "I don't know if this is significant, but did you know the name Orez is the Hebrew word for rice? But I checked with some linguistics experts, and Orez is not a Hebrew surname and doesn't seem to be a surname of any known nationality."

Not sure what to make of the rice and the Hebrew reference, but armed with this knowledge that Joe's identity was now more suspicious than ever, Rafael decided to take a bold step. He e-mailed an actuarial survey to every Fellow. The idea was brilliant, if somewhat unethical, and depended on a well-known security flaw in most people's word processing software: Rafael's survey contained a hidden file attachment. If the recipient completed the survey and e-mailed it back to Rafael, Rafael would then have a small piece of spy software installed on the recipient's computer. Rafael was sure that the egotistical Joe could not resist the opportunity to comment on Society matters, and indeed Joe was among the first Fellows who returned the survey.

Several days later, Stanley and Ed met for beers in the same bar where the Joe Orez idea had originated. Each of them had some Joe Orez news to share with the other.

Stanley explained that he discovered someone was hacking into his home computer. Stanley considered himself quite the computer techie, and he had some elaborate anti-spy software. He was able to probe backwards into the computer of the person doing the spying until he discovered that person's name. He didn't recognize the name, until he ran it against various databases of names. "You'll never believe who it is – another actuary!" he exclaimed. "I never heard of him, but he is some older guy named Rafael Gonzalez."

"I checked my computer, and I made sure to encrypt anything personal. As far as Rafael knows, he has hacked into Joe Orez's computer. In fact, I added a bunch of actuarial spreadsheets and memos with different dates under Joe's name. Then I probed Rafael's computer, and I discovered he is on a mission from the Society to track down Joe's identity."

"Wow! What do you think we should do about this?" asked Ed.

"I think we should divert Rafael's attention a little bit. I did some research on him, and I was able to recreate enough of his employment and personal history to be dangerous. I pretended to send Rafael's resume to Stanton Consulting. Then I sent Rafael an e-mail under the name of Roger Stanton, president of Stanton Consulting, thanking Rafael for his resume and interest in the company, but unfortunately there are no job openings at the moment. Soon Rafael's resume will go out to two hundred random actuarial employers. I wonder if one of those two hundred is his current employer?"

“That should slow him down a little!” replied Ed. “Now I have some news for you. I picked up a phone message for Joe today from one of the younger Fellows. The Society presidential election is coming up, and the Nominating Committee has put up a pretty stodgy candidate. The younger Fellows want Joe Orez to run for Society president. Isn’t that hilarious?”

“What a goof that would be! I say we run Joe for president. After all, he is so opinionated that he would make a wonderful candidate,” Stanley replied.

Ed agreed, and the two of them sent in the form to run Joe for Society president. Joe was deliberately vague on his background – purposely omitting his college degree, for example, since that would be something traceable. They couldn’t have the scandal of Joe claiming to have a degree from, say Harvard, when Harvard would have no record of him. Although his education was lacking, in his short actuarial career Joe did have an impressive resume of Society committee assignments and publications.

In the following months, Joe participated in the spirited online debate over Society presidential issues, never failing to reply to any issue, no matter how trivial. Joe always took the youthful, liberal, anti-establishment position, much to the dismay of the older and more conservative actuaries. The Society had grown so much in recent years, that there was talk that Joe had a majority of the membership behind him. However, it was well known that the younger actuaries felt disenfranchised by the Society and were unlikely to vote in the election.

Breaking with tradition, the Nominating Committee’s candidate called Joe and invited him to a face-to-face debate, to be shown live over the Internet. Joe politely declined, not wanting any more exposure than he already had.

Stanley and Ed were having a great time with all this, howling in laughter in how easily the Society had been duped over the whole Joe Orez charade. Another thing they found pretty funny was a letter Rafael had sent to Roger Stanton, apologizing for the fact that somehow his resume had been sent to Roger in error. Stanley wondered how many similar letters Rafael had written to other companies. Rafael seemed no closer to discovering Joe’s secret.

“Rafael doesn’t know what Joe looks like. Do you know what Rafael looks like?” Ed asked.

“No, why?”

“I went to the post office box an hour ago to pick up Joe’s mail, and there was a middle aged guy hanging around near Joe’s box as if he was waiting to see who opened it,” Ed explained. “I decided not to go to the box with him there.”

“I thought Rafael gave up on outing Joe. But if Rafael is still at the post office, maybe Joe himself should pick up the mail today. How about if I get dressed up as Joe and get the mail?”

“I love it! That will really freak Rafael out,” replied Ed.

Stanley went to the post office dressed as Joe, waited until there was a large group of people he could sneak behind, and picked up the mail. Rafael had been waiting a long time for someone to take mail out of Joe’s box, and he was not ready for someone to do so. By the time Rafael recovered from his shock, Joe was long gone. Stanley could see Rafael cursing from a distance away, that he had missed his chance to catch Joe live.

A few more months passed, and finally it was time for the election. Joe dutifully voted for himself as president, as did Stanley and Ed, so they know Joe would get at least three votes. When the votes were counted, Joe had been elected Society president.

“This is great,” exclaimed Stanley. “Can you imagine all the reforms we can push through as president? Where should we start?”

“Are you crazy?” Ed asked. “Joe doesn’t exist. He can’t be president. Plus, he is going to have to appear in public at the convention, to attend board meetings and club meetings, and to give all sorts of speeches and presentations. How do we get permission from our boss to do this? We can’t keep saying that Joe can’t travel. I hate to say this, but I think it’s time to give up the charade.”

“You’re not saying that you want to confess Joe is a fraud, are you?” asked Stanley.

“I think we’ve taken this too far. Yes, I think it’s time to confess,” replied Ed.

“Do you mean confess publicly, like Dustin Hoffman did in the movie ‘Tootsie’? I don’t think so,” Stanley said defiantly. “I’d rather die first than admit defeat.”

“Die? Wow – what a great idea! Let’s kill Joe! It would be so easy! All we need to do is write an obituary and have it printed in the newspaper. Do you think the newspaper actually verifies each death notice it prints?”

Ed made a quick call to *The New York Times*, and he learned the minimum price of an obituary was \$172. “Boy – the cost of dying is more expensive than I thought! At least we can stop paying Society dues for him.”

Stanley looked at Ed with a tear in his eye. “This is so sad. Are you sure we should do this? I feel like I’m losing a good friend.”

“I think it’s the merciful thing to do. Let Joe go out with the dignity he deserves.”

“Oh, let’s do one more thing before Joe dies. Let’s send our friend Rafael a little package,” Stanley said, and he and Ed prepared a box. They included a note, and they dated it October 31.

The obituary appeared in the *Times* on November 3. Just to be sure the Society saw it, Roger Stanton faxed a copy to the Society office.

Joseph P. Orez, 25, of New York City, died unexpectedly in his sleep on November 1. Mr. Orez was an actuarial consultant and partner at Stanton Consulting. He was a Fellow in the actuarial society and despite his young age had recently been elected its president. A private ceremony was held on November 2 for family and close friends. Memorial donations may be made to the Actuarial Education and Research Fund in Schaumburg, Illinois.

Phone calls and e-mails to Stanton Consulting received an auto-reply that the company was devastated by the death of Joe Orez, and that the company was temporary closed. Several weeks later Roger Stanton sent out an e-mail that the company could not survive without its only actuary, and the company, which was a partnership, was dissolving. Soon after, the telephone, web page, e-mail and post office box were all closed.

Damien Brady, the Society staff and the Society board considered the Joe Orez matter closed. They thanked Rafael for his work and discharged him from his duties. Rafael found the obituary extremely puzzling. He had many unanswered questions. Why was there was no specific mention of surviving family members? What was the name of the funeral parlor? Where were Joe’s remains? Rafael checked with the *Times*. The obituary had been faxed to the newspaper with the letterhead of a funeral parlor, and the newspaper had a valid credit card charge for \$172 for the obituary from Stanton Consulting. Rafael then tried to check on the funeral parlor, but nobody had heard of it. He called Information, and there was no personal phone listing for any member of Stanton Consulting. He was not happy with this turn of events.

The next day, Rafael received a box at work with the following note, dated October 31:

Dear Mr. Gonzalez,

Although you and I have never met, I know you took an avid interest in my life and activities. I am not feeling well, and I will not be needing these any longer. Perhaps you would like them as a small remembrance of me.

*Sincerely,
Joe Orez*

The box contained the two pairs of Joe’s black sunglasses. As Rafael munched on his lunch of Chinese take-out food at his desk, he looked at the sunglasses, thought about Joe,

and then looked at his food. Chicken with broccoli and rice. Rice? Didn't Judy the English professor say that Orez is Hebrew for rice? And Hebrew is read from right to left. If you read Orez from right to left, you get Zero. Could that mean something? Nah.

END

The idea for Joe is loosely based on a similar idea that appeared in the 1960's television show "Room 222."

The author would like to thank the staff of the Casualty Actuarial Society who explained some of the administrative details of Society membership and explored the possibility of creating a fictional actuary.

2051: A MIND ODYSSEY

By Beverly J. Orth, JD, FSA

“Is this the room for the Course IA seminar?” I asked the man approaching the meeting room door. “Yes, it is. You’ll want to get a seat near the front so you won’t miss any of the valuable details.” I surmised that he must be our instructor, Perry Kramer. I introduced myself and took a seat in the front row.

As others entered the room and selected their seats, I noticed several pieces of electronic equipment on each table. I studied the contraptions in front of me. Several items bore a strong resemblance to medical equipment I had seen in my doctor’s office.

“Excuse me, Perry, but this looks very much like a blood pressure cuff. Will we be using it?”

Perry smiled and said deliberately, “Yes, before the end of the seminar, everyone will get a test run.” I was wondering what he could possibly mean. My thoughts were interrupted by a new arrival on my left.

“Have you attended one of Perry’s seminars before? He’s the best.” I replied that this was my first actuarial exam and, no, I hadn’t been to any of Perry’s seminars. “You’ll learn a lot. The breathing exercises are outstanding.” Blood pressure cuffs and breathing exercises? These sounded more like a birth preparation class than an exam preparation seminar. Maybe I was in the wrong room after all.

The room was filled now with 48 expectant faces. Perry announced that the seminar was starting and someone in the rear of the room closed the doors.

“I’m Perry Kramer, and I’ll be your instructor for the next three days. When you leave here Sunday evening, you will be fully prepared to sit for the Course IA exam of the Society of Actuaries. How many of you have attempted Course IA before?” Many hands went up. “And who will be making their first attempt?” I raised my hand, along with five or six others scattered around the room.

“I hope you all brought the materials I sent you in advance. If you forgot anything, I have a few extra discs here in the front. We’ll spend three hours this morning reviewing all of the mathematics you will need for the examination. Then we’ll spend five hours this afternoon working practice problems.” Sounds fairly routine, I thought. I was unprepared for Perry’s next statement.

“The exam itself will consist of one question. We know for certain that the one question will be selected by the Society from the set of practice problems we’ll review today. If you know how to do all of the practice problems, then you have a high probability of passing the multiple choice portion of the exam.” I sat in stunned silence while a couple of hands went in the air.

From the back of the room, a voice queried, “Perry, I’m one of the newbies. I thought the entire test would be multiple choice.”

“In a sense it is. There is only one exam question, as I said, and the answer to that question is either A, B, C, D, or E.”

I posed the next question. “So if we know all the answers to all of the review questions, then we’ll know the right answer and we’ll pass?”

Perry paused slightly before answering. “Well, yes and no. You’ll know the right answer but you won’t necessarily pass.” Most of the room nodded in agreement. “That’s

why you're here at my seminar. So you'll know the right answer and you'll be able to pass the other elements of the exam."

"But the Society's syllabus doesn't mention any other elements, just probability, statistics, and interest theory," stated the newbie from the back of the room. "What else is the exam testing?"

Perry smiled again. "The examiners are testing your physical and psychological responses to the exam question, and to your surroundings. The nonmathematical elements of the exam include blood pressure measurements, pupil size, and respiration. And you'll also be tested on endurance."

"Why aren't these elements mentioned in the exam syllabus?" I asked. I was feeling manipulated, but didn't know whom to blame: the Society, Perry, or myself.

Perry continued, "The exam process has evolved over the past 35 years. In the second half of the twentieth century, the exams did attempt to measure actual knowledge of the syllabus material. But the process didn't work very well. Even the examiners admitted that people who were skilled at guessing or who were just lucky passed exams while others who really knew the material often failed. The grading process was time consuming. Even the pure multiple choice exams were difficult to grade because questions were worded ambiguously or had other flaws.

"By 2008, the examiners were requiring fingerprint and iris identification to combat the hiring of professional exam takers. These ringers made a living by taking exams for people who had given up due to the haphazardness of the exam results.

"It was in that year, 2008, that an enterprising graduate student from Stanford asked for permission to study the fingerprint and iris data. She wanted to test her theory about

criminal tendencies resulting from periods of intense studying. The student's research took some five years, but she discovered something wholly unexpected. She found that the individuals who had the highest exam scores had the least smudged fingerprints and the largest pupil size. This result held true, regardless of the content of the exams or whether they were multiple choice or essay. Of course, the Society did not know what to make of this discovery, but decided not to publicize it. Instead, they decided to do more research, thinking that perhaps they could use this information to shorten the exam grading process.

“Over the next ten years or so, roughly from 2014 to 2024, the Society added more physical measurements, ostensibly to prevent cheating and the use of ringers. The real purpose, however, was to gather more data relating blood pressure, respiration, pupil size and so forth to exam results. The initial methods were somewhat crude. They made exam takers wear a finger cuff that measured heart rate and blood pressure, which made using a calculator somewhat difficult. Gradually, the methods became much more refined and measured many more variables.”

A new voice interrupted Perry. “Why did the Society reduce the number of exam questions to just one? How can they possibly test a person's knowledge with a single question?”

“Well, eventually the Society looked at the correlation between the results on subsets of exam questions and the physical measurements. They discovered that the individual's performance on the first five questions was an excellent predictor of results on the entire exam, especially when combined with the physical measurements. Of course, none of this information was made public. What I know about the history of the exams over this period I have gathered from several generations of exam takers.

“By 2030, it appears that most exams had been shortened to just five or six questions. Most of these questions were repeats from prior years, but the Society still added one or two new questions per year.

“It was around 2032 or 2033, about 20 years ago, that the Society began adding psychological stressors to the exam process. As they reduced the number of questions per exam, they found that students were feeling more relaxed and the physical measurements were becoming less reliable. So, the Society borrowed some concepts from the military. Hence, the addition of stressors.”

“What do you mean by stressors?” I asked, hoping that the alarm I was feeling did not show in my voice.

Perry’s calm reply was reassuring. “Nothing painful, no physical torture or anything like that. Just normal things that people have always experienced during exams. But instead of being unintentional or just bad luck, these things were now deliberately planned and executed.

“For example, exam takers often complain that they did poorly because the person next to them coughed throughout the exam, or because the proctor was humming opera songs or rattling newspaper pages. The Society collected anecdotal evidence of noises that exam takers found distracting by monitoring actuarial web sites and chat rooms. Then they added these features in a purposeful, deliberate way to the exam environment, to increase the students’ stress levels and improve the reliability of the physical measurements. And they were enormously successful. By 2038 they found they could reduce the number of exam questions to just one per exam and maintain the same high correlation between physical measurements and knowledge.”

“But the exams are still three hours long!” exclaimed a woman seated near the window.

“Yes, they are. One of the stressors is based on endurance. Having to sit at a table for three hours is a stressor. I’ll show you some stretching and yoga exercises tomorrow that will help to counteract that one. Another stressor is the calculator the proctors will provide to you. Roughly 35 percent of the calculators have randomly programmed errors or a failing battery. You can exchange your calculator once during the exam, but you might receive one that is worse than the one you turn in. It’s best not to request an exchange unless your first one doesn’t turn on at all.”

“But if you have only one problem to work on, do you even need a calculator? After all, you have three hours to do a single problem,” stated the woman near the window.

Perry nodded in agreement. “The Society thought of that, too. That’s why the single question always involves a type of calculation that would be impossible to do without a calculator. There is always a logarithm, an annuity factor, or something like that. The single question will come from the practice problem set we’ll work this afternoon, but the Society changes the numbers slightly every time, so sheer memorization won’t work. You will need the calculator and you’ll need to rule out any random errors. I’ll demonstrate some techniques for testing the calculator you receive to determine if it’s a bad one and, if it is, how you can still get the right answer by eliminating erroneous results.”

“What are the other stressors we can expect?” I asked. I was feeling a little better now, as it was clear to me that Perry had an answer for every question.

“One of the Society’s favorites is to put the exam room in a noisy location, like near a cafeteria. Having a jackhammer right outside the window is another one. The yoga and meditation exercises we’ll learn tomorrow should be helpful for the noise stressors.

“Another type of stressor is the defective exam booklet or answer sheet. Back in 2002 the Society unintentionally printed hundreds of exam booklets with either missing pages or duplicate pages. About 20 percent of the individuals who initially failed were granted passing scores after a class action lawsuit was filed against the Society six months later. The Society took extreme care after that fiasco to avoid such defects, until 2035. That’s when someone remembered what happened in 2002 and thought the defective booklet scenario would make a good stressor. Now, about a quarter of exams include some type of printing defect. If you suspect you have a defective booklet or answer sheet, you should request a replacement immediately. They don’t always have enough replacements for everyone who asks for one. Just another potential stressor.

“If you do get a defective booklet and you can’t get a replacement, don’t panic. You can still pass the exam. You always have a 20 percent chance of getting the right answer on the exam question. And you’ll pick up points if you keep your respiration, blood pressure, and heart rate steady. Reacting to the stress and displaying symptoms of panic, however, will doom you. Remember, physical symptoms of stress correlate directly to your exam score simply because the Society found a similar correlation some 30 years ago under very different circumstances.

“Well, that’s enough background. Let’s get started on probability distributions. Open your virtual notebooks to Tab A, please.”

Force of Mortality

They say that in heaven one neither marries nor is given in marriage. So Jennifer was surprised to learn that John still stuck in her memory. That had lived together for 46 years, so perhaps it was normal that the recollections should remain so strong and clear.

She had died easily, slipped away one night in her own bed. The children and the grandchildren had come to the funeral. She hoped they would remember the happier times.

.....

Every Thanksgiving, the whole family had come to her house, bringing salads and pies to complement the traditional turkey dinner with dressing and gravy, two kinds of potatoes, rolls and all the other trimmings.

John had always teased her about making the special cranberry relish. He thought it was a waste of time and effort. But everyone else really liked it, so she was happy to do it every year.

.....

Until it had gotten too hard to get around. They had sold the house where they had lived so long, and with proceeds from that had moved into a continuing retirement care community. There was no room for their furniture, of course, but she had packed their scrapbooks and other personal items that were filled with memories. Shady Acres it was called. Like something from a three hanky movie.

Mary Alice and her husband had taken over the task of hosting Thanksgiving dinner.

.....

Then John had had the cerebral accident. The CCRC folks moved him into the nursing care section. So long as his brain waves continued their sad little dance, the tubes and pipes and electronic marvels kept him breathing. Breathing kept his heart going, and the blood going to his brain completed the circuit.

At one point, he had been the subject of a court case. The judge had concluded that the annuity policy had to keep paying the nursing home as long as John was alive. And had defined alive to mean that brainwave activity continued. The CCRC was happy to keep on getting the money to keep the electronic devices working. Another little cycle working perfectly through the banks and the company income statements.

John continued to lie there. His eyes were closed.

Jennifer had wondered whether to be glad or sorry.

.....

At one time, the doctors had determined that John could still hear. Then one day, his hearing no longer worked.

Jennifer had to admit that he was still alive according to the definition. But she didn't call it living. He was just drifting there. Waiting. Waiting.

Like Jennifer herself, now. Waiting.

It seemed to Jennifer that it was up to her to do something. But what could a spirit do?

She sought the advice of the High Actuary. Maybe he could help her.

.....

His assistant ushered Jennifer into his room. It looked rather like a movie set for a lawyer's office. Or maybe a minister's study. Something like that. The walls were lined with glass-front bookcases. Everything else was paneled in wood. There was an upholstered chair next to the roll-top desk. The assistant motioned Jennifer to sit down. The High Actuary looked at her expectantly.

Hesitantly, Jennifer explained about her husband and how much she missed him. She wanted him to be released from the loop he was stuck in.

The High Actuary turned to his desk. When he rolled back the top, it looked to Jennifer like the screen of a huge computer, but it was turned so that she couldn't read it. He pulled out a keyboard and began to type.

After a brief pause, the actuary looked away from the screen and said to Jennifer, "You're right. Now here's what you need to do."

.....

It was late afternoon. A volunteer in a pink and white apron stopped outside John's room. She had a feeling that she should go in. There was nothing there for a "candy-striper" to do, so after a brief look around the room she turned and went back into the hall.

She didn't notice that a small paper cup of water tipped over as she brushed past the rolling table on her way out.

A few hours after that, one of the connections in the respirator shorted out from the presence of a small amount of moisture. The respirator stopped working.

.....

As the children and grandchildren gathered for the second funeral, someone remarked, "I think they are finally back together again."

The High Actuary, watching on his eternal internet monitor smiled. Leaning back, he waited for the screen saver to come up. It was programmed to choose an aphorism at random, and he still enjoyed the small thrill of surprise as the current message appeared. It scrolled across the screen, "An actuary is someone who expects everybody to be dead on time."

Large Scale Shifts

“It required a large scale paradigm shift. As you know, before 2020 all the testing was handwritten. The emergence of technologically advanced multi-discipline testing centers paved the way for adding a verbal section to exams avoiding the obvious economic obstacles of the Society tackling a new exam procedure alone.” Frank paused for a moment to give Ellen a chance to respond. The only emotional response from her round, suntanned face was a furrowed brow. Her hair was light brown and was done up with the loop in the back that was the current craze. He thought it looked a little like the Greek symbol for standard deviation. Getting no response, he continued. “The other piece of the paradigm--”

Here Ellen broke in as was her habit of doing. “Yes, I know, the branching out of actuarial science into other fields with unique designations and testing for each. I did pass Section II the 1st time you know.”

Frank, as Ellen well knew, was well aware of this. Painfully aware of it at times Frank thought. Ellen had glided through the exams. Her scores were not at the top as a result of the verbal portion but her keen analytical and mathematical ability provided her the luxury of studying more for the verbal while barely reviewing the math portion. Frank had struggled, but he had a great deal of pride for his precocious sister although he often thinly disguised it with good-natured teasing. He got back to her jibe. “Yes you did, and you would think that an occupation so adept at understanding and applying a law that describes a condition whereby greater accuracy and credibility yet with less deviation

could be achieved would be able to apply that same law in a creative fashion toward themselves. By the way, that was on Section II, what was the name of that law?"

Ellen wrinkled her nose showing her irritation. "OK, I might not always be good at applying the math verbally but I do know that." Ellen jumped up from her JustRight chair and walked into the kitchen. The chair slowly molded back into a generic shape. Frank was still amazed at them. The new chairs were temperature controlled and would fit to the form of your body. Some Actuarial students had justified buying them saying they improved exam performance. He didn't know about that, but he did know they felt great after a long day of work and studying. But back to the problem at hand. What to include in his speech to the new Actuarial students that were being recruited.

He thought back over the changes the Society had gone through over the years. One big shift had been the branching out of Actuarial Science into other careers beyond mainly insurance. Large banking and investment firms had not shown much interest until the Society proposed in 2025 to have a section devoted to potential non-traditional actuarial careers with representatives from each type of business. Banks, Investment and Industrial firms were the first three to join in successive order over a period of several years. The tests had been made unique for each and the titles unique as well: Bank Actuaries, Investment Actuaries and so on. At first, there was not a significant difference between a traditional quality MBA or Financial Engineering graduate and the Actuarial counterpart, but for a variety of reasons, the Actuarial candidates began to outshine the others.

First, the material covered. In order for banks and others to buy in, they required testing that covered most of the essentials of banking and that were not significantly

different from current industry exams. But over time, the tests and course work began to combine the traditional financial and engineering material with more statistics and higher level modeling and mathematical analysis of the data. Non-traditional actuarial candidates began to be looked at as individuals who knew as much as a traditional MBA but who had a significant edge in understanding key industry statistics and how to analyze them. Much of this edge came from the course work and testing but there was one other valuable tool that potential actuaries began to take advantage of.

A few years after the emergence of non-traditional actuarial programs and testing, the Society decided to put a new face on the monthly Actuarial publication. With the significant increase in the number of actuaries, there was opportunity to expand the magazine and improve the quality if they could get actuaries to buy in. It changed its name to Actuarial Reader, started coming out weekly and greatly improved its quality by creatively applying the Law of Large Numbers.

The Law of Large Numbers said that increasing the number of exposures would improve accuracy, credibility and decrease volatility. The Reader simply began taking advantage of the hundreds of thousands of new actuaries and started encouraging actuaries to write articles for the Reader. The best would be chosen.

As the number of actuaries increased, so did the quality of the Reader. And so did the numbers and quality of the Publication staff. One unique idea was to organize the Reader by occupations and have a lengthy summary of key industry statistics and facts before every section. This expanded the number of readers by allowing the less proficient to learn and understand articles that were more technical. As a result, demand increased and so did the economics.

The Reader was making money; and following the “Law”, it gave much of it back to those who wrote the articles creating even more interest. There were a few details to work out. There were so many articles being sent in, the Society started requiring Actuarial students to read and give a critique and filter out the best ones themselves before they were sent to the Publication staff. But as a result, the candidates began to improve verbal and critical thinking skills as they became used to sorting out the good from the bad. As a result, Actuaries improved their writing and critical thinking skills. They also greatly benefited from the Reader’s organization and quality analysis.

Frank thought he had enough to put down on paper. Funny how that phrase stayed around even though paper no longer existed, he thought. He could still hear Ellen rummaging around in the kitchen. He saw her out of the corner of his eye as she started walking back in the room. She was singing something strange.

“Ooh la la, alpha and omega”

“Ah lo lo, R-square and a row”

“What the...!!” Her Greek symbol shaped hair began to contort out and began forming all sorts of shapes and equations. Present value annuity functions, maximum likelihood functions...

At this point, Frank became aware of a bright light being thrust into his face. He instinctively brought his hand up to shield his eyes from the light and peered out with half opened eyes. Instantly, recognition came to him. He was at the Dream Research Center and he had just been aroused from what had turned into a disturbing dream. He couldn’t remember much of it, just that Ellen had been in it and had started singing Actuarial songs just before they woke him up. He smiled thinking about it.

He noticed that Sharon and her assistant Chip were busy removing and putting away the myriad wires and diodes that had been hooked up to him. He remembered that she had thought actuaries were “bean counters” so he had explained that actuaries worked for insurance companies mostly and did pricing and cash flow testing and a few other things but she had tuned him out at that point. Dream research had become a science that was replacing much of the old tried and trusted prediction methods and Sharon was aware of it. Even actuaries had been affected by the newer graduates in Dreamology. With their current research methods they had become much better at predicting the intangibles that a static model or formula never would. Even the dynamic actuarial models had been left in the dust.

“You can go down now. Thank you for volunteering and we will let you know how it worked out.” Sharon escorted him to the doorway and waved as he left.

Chip held out Frank’s dream transcript to Sharon. “Should we keep this one for laughs?” Sharon smirked, “More like grimaces than laughs. This guy obviously has been taking too many barbiturates before exams. Toss it.”

Chip crumpled it up and tossed it in the direction of the trash field. “Is this intended for recycling?” a voice spoke up in the general direction of where he had thrown the paper manuscript.

“Yes, another failure Mini” Chip responded as if the digital computer was something other than plastic and circuitry.

Chip looked over at Sharon thoughtfully. “He did show a little more promise than the previous guy. Lawyer... ever heard of it?”

“Something to do with ambulances I think” Sharon answered as she called for Mini to shut off the lights on their way out.

By Mark Horton

Mark_J_Horton@aol.com

Lin's Story

by Sajid Zahid

“Bary !” Lin called out unable to get the “m” out of his clogged nose. “Could you help me get sub papers frob the top shelf? That tall fellow has a habit of keepig ibportadt thigs out of by reach.”

“I’ll be right there.” Mary shouted cheerfully from the next room. How she maintained her cheery attitude at all times was something that Lin admired but never understood. She sees the world differently, he thought, for the millionth time. It was only a bit irritating. But everything was at least a bit irritating today.

He looked at the top shelf, completely out of his reach and wondered if the height of humans would continue to increase with time. In the Middle Ages, sixty inches was a reasonable height for a man. In the 1914-18 war the average height of a soldier was 66 inches. Another forty years later, it had grown to 69 inches. Now it was over 73 inches. He was 66 inches tall. As Mary brought in the little stool he thought aloud, the sarcasm obvious in his voice, “When I was young, my elders often said that tall people were of lesser intelligence. I never quite agreed, however, this Tall One would definitely make a good candidate. He knows I can’t reach that high up.” He knew he sounded whiny but he couldn’t help it. He felt dreadful with the cold that he hadn’t been able to shake for several days now.

Mary, a petite woman, only a few years younger than Lin was much more physically active and had maintained her health and her good humor better than Lin, whose mostly sedentary habits had given him stiff knees. She placed the stool at the foot of the tall bookcase and looked at the top shelf where several boxes filled with paper were precariously balanced on top of one another. “You really should stop using paper.” She said shaking her head. “I think he does it intentionally to encourage you to use your databank.”

“But I like paper. It’s got a good old fashiod feel to it and I cad see everythig at wodce.”

“How is your cold, darling?” Mary asked with a knowing smile as she reached for the box labeled *FFS Report*, and brought it down trying not to spill its contents all over the already littered floor. Lin was particularly difficult when he was sick. And he sounded awful.

Lin thought that that was a rhetorical question. He wanted to say, “My cold is always nasty.” But the gentle touch of Mary’s hand on his forehead made him change his mind. He mustered up a smile and said gratefully, “Biserable. Could you please see that dothig disturbs be for a while? I’m really trying to codsedtrate.”

“Just holler if you need anything, okay?” Mary said softly and left. Lin turned to the box of papers and lifted out the few sheets he needed and started to read.

Forecasts for The Second Half of the 21st Century

Presented by
The Secretary, First Factuaries Society (FFS)
Date: December 8, 2051

Beginning with a Purpose

At the turn of the 21st Century, the social mathematicians, financial engineers, financial architects, or soothsayers of this world; otherwise known as actuaries, were ranked second in “America’s Top Ten Jobs.”

For more than half a century, actuaries had influenced people’s lives with their special problem solving skills. But it was restrictive slogans like “*Actuaries make better financial sense of the future*” that brought change within some actuarial societies giving way to the formation of the world’s First Factuaries Society (FFS) in 2005.

Initially the membership was drawn solely from actuaries across the world, but later on several non-actuaries joined, widening the effort to understand the future. Today, 46 years later, almost half of our members are not actuaries.

Like actuaries, factuaries also rely largely on math, law, and economics but they also utilize the experience of other scientists to develop forecasts. Surprisingly, it was not their technical abilities but their communication skills that won them first ranking in “America’s Top Ten Jobs” for 2006 and every year since.

End with a Mean

Forecasts are made regularly by the Society and are checked once every ten years. Based on experience, future projections are revised. In what follows, the development of the past 50 years is set out in ten-year groups.

	2001 – 2010	2011 - 2020	2021 - 2030	2031 - 2040	2041 - 2050
Life Expectancy	<ul style="list-style-type: none"> Increased to 90 	<ul style="list-style-type: none"> Increased to 100 	<ul style="list-style-type: none"> Increased to 105 	<ul style="list-style-type: none"> Surges to 115 	<ul style="list-style-type: none"> Increases to 120
Working Life	<ul style="list-style-type: none"> Actuaries decide that there is no biological barrier to the span of life 	<ul style="list-style-type: none"> Working life time gradually shifted from 35 to 75 years 	<ul style="list-style-type: none"> No change 	<ul style="list-style-type: none"> No change 	<ul style="list-style-type: none"> Employment starts at age 40, retirement at 80
Work Timing	<ul style="list-style-type: none"> No change 	<ul style="list-style-type: none"> Week reduced to 6 days with 4 working days 	<ul style="list-style-type: none"> Week extended to 10 days with 6 working days. Working hours per day reduced to 5 	<ul style="list-style-type: none"> No change 	<ul style="list-style-type: none"> Working days 150 in one year Working day- 4 hours
World Clock	<ul style="list-style-type: none"> The US adopts one time zone 	<ul style="list-style-type: none"> Western Hemisphere adopts one time zone 	<ul style="list-style-type: none"> The world adopts one time zone 	<ul style="list-style-type: none"> Proposal of 19 weeks of 19 days each rejected 	<ul style="list-style-type: none"> Months abolished. Reckoning by years and days
Healthcare	<ul style="list-style-type: none"> Growing concern over health care costs for the elderly Limited success in cloning if humans Achievement of re-growth of hair on bald heads AIDS controlled 	<ul style="list-style-type: none"> Scientists achieve re-growth of teeth at age 80, and some human bones. Arthritis controlled. Cancer cured. Diabetes cured. DNA Modification testing for disease prevention. 	<ul style="list-style-type: none"> Re-growth of vital organs like heart, liver, kidneys shown possible in laboratories DNA modification done routinely at birth for disease prevention. 	<ul style="list-style-type: none"> Cloning rises dramatically and so do "one parent" families Most of wear and tear of old age overcome by "repairs" 	<ul style="list-style-type: none"> Every human has a unique number and is connected to a central station Severe problem of family support in old age. People advised to have children after age 80. Family support problem partly solved

	2001 – 2010	2011 - 2020	2021 - 2030	2031 - 2040	2041 - 2050
Communications	<ul style="list-style-type: none"> Decline and discontinuation of Internet 	<ul style="list-style-type: none"> Ban on use of computers in schools Automatic translation from and to American English for 18 languages 	<ul style="list-style-type: none"> No change 	<ul style="list-style-type: none"> Development and use of data memory chips 	<ul style="list-style-type: none"> Free phones except to colonies on Mars
Production	<ul style="list-style-type: none"> Increase in food production 	<ul style="list-style-type: none"> Leap in man-made food production and beginning of decline in agriculture. Farm subsidies finally abolished 	<ul style="list-style-type: none"> No change 	<ul style="list-style-type: none"> Some items no longer mass produced- clothes, shoes, most furniture 	<ul style="list-style-type: none"> Mass production further declines
Leisure	<ul style="list-style-type: none"> No change 	<ul style="list-style-type: none"> No change 	<ul style="list-style-type: none"> Problem of leisure-fear that people will be "bored" 	<ul style="list-style-type: none"> Moveable homes help in reducing "boredom" 	<ul style="list-style-type: none"> Entertainment leads to invention of new games
Fuel and Transport	<ul style="list-style-type: none"> Breakthrough in replacing fossil fuels by mini battery cells. Too expensive for general use 	<ul style="list-style-type: none"> Mini battery cells used in cars Telematics used extensively for driver / car communication 	<ul style="list-style-type: none"> New public transport envisaged, but not introduced 	<ul style="list-style-type: none"> New transport system in a few cities. Moving paths. Individual box cars 	<ul style="list-style-type: none"> No change
Education	<ul style="list-style-type: none"> Increase in world literacy attributed to intranet use 	<ul style="list-style-type: none"> English (American Version) adopts phonetic alphabet 	<ul style="list-style-type: none"> No change 	<ul style="list-style-type: none"> No change 	<ul style="list-style-type: none"> Poverty abolished. Population 100% literate. Steady population
Environment	<ul style="list-style-type: none"> No change 	<ul style="list-style-type: none"> New-York and Sao Paolo climate controlled First colony on Moon 	<ul style="list-style-type: none"> First permanent settlement made on Antarctica. Mining operations commence. All human habitation has climate control. 	<ul style="list-style-type: none"> No change 	<ul style="list-style-type: none"> No change

Decennial Reports

Those who are interested in the details may refer to the reports the Society has prepared at the end of each decade. These reports give a comparison of the expected and experienced improvement in various fields. The purpose of the Society is not altruistic. It did not aim to improve the quality of life or to extend the human life span. It aims at pure and simple projection (previously called prediction) of the type of life human kind will face in the future on this earth and on the colonies beyond. Lobbies have grown recently which press for action in their chosen fields.

Before taking up the predictions for the next 50 years it might be pointed out that this is the first time in the Society's life that such a long-term projection is being made. The main reason for this exercise is that the Society has gained enough experience in projecting the future for 10 years. This memo is for a 50-year projection. The usual 10-year projection is under preparation. It takes longer to prepare the latter as it has to be more detailed. The comparatively long-term projection is in "bold strokes".

A Not-so-Cold Future

“Aaaachhooooo,” Lin sneezed after sucking in a deep hesitating breath, expelling millions of germs simultaneously traveling at over 70 miles per hour, giving his itching sinuses some relief. No matter what the temperature was, high or low, he somehow managed to catch the dreaded Common Cold.

Ever since he could remember, he had been Common-Cold-prone. It came and went almost unnoticed. He did not pay much attention to it. It was part of his life. Almost mechanically, he decided it was time for a cup of tea with some citric acid. At 121, Lin had years of experience with the concoction. It always managed to ease the symptoms.

Born in 1930, in Northern India, he had survived various western and eastern medicinal traditions, most of them more ceremonial and ritual rather than therapeutic, each with its own degrees of successes and failures.

As far as he could remember, everyone had always had The Cold. It was a disturbing and distracting condition but was never severe enough to require any special attention. It wasn't serious enough to warrant any sustained DNA testing. In any case, the testing that had been “completed” never revealed any clues or cures. But DNA testing in itself had seen a lot of other successes. Now it was possible to determine the outcome of a person's life with much more certainty. In many ways, science had progressed to the point where the quality of one's life was almost predetermined. The last 50 years were unique. Previously, new inventions had emerged almost as miracles, for example, plastics, TV, computers, mobile communication, etc. We also know of large unexpected losses due to the Black Death, 1919 Flu, AIDS. One cannot be absolutely certain what lies ahead of us.

Despite all the advancements, Lin persisted in his own search for a cure for the Cold. He had tried all the popular systems of medicine in India, including Ayurvedic, Chinese acupuncture needles, and strange herbal medicines from Germany; to no avail. In his early sixties, one of his uncles persuaded him to seek the medicine of a Holy Man; but the hocus pocus had absolutely no effect on the physical or psychological symptoms of the problem. After realizing that although his condition was hopelessly distressing, the search for a cure had proved more stressful. Since it was not going to kill him, he surrendered to the itching, dribbling, swollen, and engorged sinuses, ensuring that he always kept a good supply of tea and ascorbic acid on hand.

Lin had retired from active life in 2000 at the age of 70. At the time, he had estimated living another 10 years.

But a lot happened during those 10 years. Studies conducted by several institutions of higher learning concluded that the use of computers at school interfered with the learning ability of the students. Schools banned their use. The new intake of computer programmers clearly showed that the blackboard and chalk method of teaching was more effective in introducing new concepts. However, at higher ages computers were of great help.

The frantic pace of change was making people work harder to keep up and many societies sprung up in the name of Futurism. One of the societies of actuaries claimed that "*actuaries make better financial sense of the future*". Different professions had their own Futurism section. Much against the essence of his own actuarial profession dealing with exhaustive mortality statistics, he could not contain his own optimism as he saw the figures of Life Expectancy surge beyond expectation. But as an actuary, his job was to make predictions about death and related risks.... not projections about life, living, and above all, possibility. There were pessimists who thought that the pension and health care benefits would become too heavy to maintain. Human ingenuity overcame these problems. Now it seemed that the problem never existed. Lin had retired soon after the so-called Y2K scare.

Some consulting actuaries worried about their precious pension plans. They estimated that the burden on the workers in order to support pensioners would increase to unbearable levels. What had been ignored was that for long periods, a single worker had supported 6 to 8 dependents. With stay-home parents and telecommuters freed of household chores by use of robots, this was halved. It was further reduced as more "work" shifted to computers and robots. Now almost 75% of the workers were engaged in Research and Development. So, only a quarter of the workers maintained every human being.

In 2005 he joined some like-minded actuaries to set up a new society with the slogan, "*We make better sense of the future.*" In the beginning the membership was restricted to retired actuaries. Gradually, experts from other fields were invited to join. The first projections made were for the decade 2011 to 2020. By then the myth that there was a biological limit to the life span of human beings had been discarded. It would not be out of place to mention that the "baby

boomer" generation was crossing the 100-year mark. They were in large numbers. Enormous amounts were earmarked for research to extend the life span and to improve the quality of life. The results were satisfactory. The intention was to concentrate upon ways and means to reduce and repair the damage to the human body due to wear and tear. Besides increasing the span of life it improved the quality of life.

While thinking of improvements in health care, Lin could not ignore nano-computers. These were introduced in the blood stream to help keep the arteries clean. They broke up potentially dangerous growths that no longer required removal. These "computers" were more like purgatives. Their use was predicted in the 20th century.

Lin felt sad. A lot of his dear friends had died "unnecessarily." They might have survived had the remedies been discovered earlier.

Some of the expected discoveries were not made in time and had been carried forward. A few of them had seemed feasible but did not see fruition. At one stage, Hydrogen battery cells were the rage but the research was discontinued. The search for intelligent life in outer space persisted. No response yet to the signals going out for over a hundred years! Robots had no doubt made it into homes but Artificial Intelligence continued to elude scientists. Anti-Gravity was considered for some older projections but never adopted. Nothing came of attempts to send live beings at the speed of light. Captain Kirk's voice echoed in his mind, "Beam me up Scottie!"

No specific effort had been made to search for goals. "Perhaps meditation will help," he thought. However, the present job was to prepare projections and not to philosophize. People had lost interest in Astrology. Zodiac signs had lost their meaning after the colony was established on Mars. Lin smiled to himself, "It would be fun to draw up a Zodiac sign table for the colony on Mars."

Robots had taken over a lot of chores. There were no humans in mines underground or under the seabed. Robots did not require rest, or tea or coffee breaks. Above all they did not form unions and go on strike.

Lin's sinuses were building up a terrible itch again, bringing him back to the more pressing issues of whether or not to sneeze. "Oh, this wretched cold!" he groaned nasally before he let out a small, most unsatisfactory sneeze. The cold was beginning to interfere with his thinking process and he had to send out the draft projections in 25 days. These would be scrutinized and amended by a committee consisting of specialists in various fields. His biggest problem, bigger than the cold, was getting this report completed and out the door. The obstacles were none others than his committee members.

Lin felt a bit irritated with the physicist on their committee. The language the woman used was unintelligible. All her input related continuously back to quantum theory and parallel universes and why lobsters changed color when heated. There was absolutely no way to distract her and bring her to the present, let alone discuss any future possibilities.

The anthropologist was determined that re-generating dinosaurs was the key to rejuvenating the planet and getting back all the lost life forms and discovery of secrets to health and survival. His current focus was some distance from the project at hand; it was on some island of Borneo that he wanted declared a dinosaur reserve. Lin's patience ran thin when trying to relate it to the current report at stake. A development of no immediate benefit was made some time back to re-generate some long extinct dinosaurs. These were kept in zoos in the Great Outdoors. They were not as impressive as the monsters Lin had seen long ago in films. However, they were a curiosity.

Likewise, each of the esteemed scientists on the team had a pet project to back. The more funding that a project received, the more the chances of its success improved. Re-growth of hair on balding heads had been one of those.

In Lin's opinion, the important issues were few. The most important of them perhaps, was the use of leisure. The ages at which persons started work needed enhancement. It would go down well with persons of all ages. The young will retain their youth and be carefree longer. That feeling of eternity, that fountain of youth that the young so naturally possess, will last longer. The older, retired persons will have more young company and possibly more family support. Those at work will have less competition.

And how one spent all that time.... especially leisure time? All this required careful consideration. Boredom, as paradise envisaged by some, "all that you want will be available;" may not be fun for long. Jokes would get old and stale, literature and forms of amusement would have to keep up. The entertainment industry might certainly see a boom.

It was entirely likely that boredom would drive people to "bad habits." About 150 years ago, the day was divided into 24 hours out of which 12 were devoted to work. Gradually the 12 hours were reduced to 8 and crime figures shot up. Respectable citizens spent a major portion of their leisure time in pubs and clubs. Very few took an interest in anything constructive.

No doubt, a few houses sported small beautiful gardens, affording the owners the creativity of working with nature, but for the most part, blocks of flats made up the world of the living. Gardening, along with its joys was almost extinct.

The psychology expert would have something to say no doubt. His idea for developing a procedure to erase leisure memory from time to time could be useful. It would mean, theoretically, that people would never feel "bored." They could read the same books, listen to the same jokes, relish the taste of the same foods etc., over and over again, for all time to come. Their senses could be renewed and revitalized to enjoy anew what they have been doing all their lives. Lin scratched his head. The time is ripe to give the fellow an opportunity to "improve the quality of life" by making leisure continuously renewable.

Mental illness, which had been a curse a long ago, had responded to Meditation. Techniques developed by the Christian, Buddhist, Hindu, and Muslim mystics had been modified before use. Some drugs had also been of help. There was need

to make leisure more absorbing. Efforts on this score will go a long way in giving people in general, and the retired ones in particular, more "zest for life". It would improve the quality of life and probably extend the life span further.

At the core of everything, Lin felt that humans would persist in their search for eternity. There would be substantial pressure from retired and older persons, to take additional steps in order to extend life span. The demand is for it to be increased to 150 years. So be it! Almost all afflictions of "old age" have been removed. There were no other suggestions worth considering. Lin felt trapped. There was no time for further brainstorming.

Almost every vital organ can be re-grown in the body. The brain was the only exception, the only really important one. It was still too complex to be duplicated or re-generated. Some changes can be made without affecting the thinking process - but these would benefit the working people more than the retired ones.

Memory chips have been used since 2035. These are implanted in the brain to provide data and language support. Their scope may be extended to allow painless change or upgrade of profession. A person having practiced as an actuary might opt to become a dental surgeon. It might take 10 to 20 days for the change to be satisfactory. It will have the advantage to an employer who wants a new type of staff. On the other hand, individuals will have the option to move from one profession to another without intensive retraining or loss of income.

"But what about the extension of life span?" A voice, an inner voice, seemed to taunt Lin. He got up to get another cup of tea with citric acid. He missed tea with fresh lemon juice. Lemons had been "out of stock" since agriculture was abolished years ago. For that matter, so had tea. The "tea" he loved was a blend of chemicals that produced all the desired tastes and effects of caffeine. He had no complaints. But he could still remember the taste of a real lemon.

"Can we not re-introduce gardening?" mused Lin. Some of the retired ones like him might like to spend time in the great outdoors even if it really meant tending to ten square feet of real soil. It could provide leisure-work as 60 or 70 years ago. He would definitely grow lemons. He remembered how his mother had lovingly planted the small trees in her small garden and proudly displayed the fruit in baskets as she harvested them. At the time he had made all possible excuses to beg out of the pruning and care the trees needed, but how that appealed to him now. He already knew that the committee members would not consider this suggestion. "That will only set us back," "We need to move forward not backward," he could almost hear them say. Maybe after canvassing support for 5 or 10 years, he would be able to get this "projection" approved, provided he is still alive. Expectation of life is an average. No individual could one say that he or she would last 10 years.

Lin's cold was getting worse, but not dangerous according to the standards set by the physicians. In the old days, he recalled vividly, there were several remedies for colds. They gave some relief but the cold, the common cold, took its own sweet time. And as he got older, the cold seemed to linger longer.

Another cup of “tea” later, Lin looked at the proposals by the medical profession. Most of it was a description of what had happened in the past. There was however, one original suggestion worth consideration. Illness or disease has been part of human experience since pre-historic times. Several systems of medicine came up in different civilizations. On some of these systems considerable literature remains. Attempts were made in the past, to learn from the experience of the various cultures and traditions of medicine and its practices. The several thousand year-old Chinese method controlled pain by sticking needles into certain nerves. A Hindu practitioner of Ayurvedic medicine had successfully cured the “incurable leukemia.” Avicenna observed that people who had suffered from malaria at least once, were spared the diseases that caused paralysis, such as MS. German herbal medicines for enlarged tonsils worked like magic. Homeopathic claims for curing asthma, skin diseases, allergies, and a host of other ailments left one breathless... with wonder. The failures to achieve a unified system of medicine were due largely to lack of resources. The culturally diverse practices of medicine would take work to bring together under the same roof. At least this portion should be taken up in the second half of the 21st century.

All three established colonies on the Moon, Luna Wahid, Luna Prima, and Luna Doppler; and the more recent Mars outpost, Phobos 2; have proved to be too expensive. Transport remains expensive and plays a big role in providing Extended Distance Travel (EDT) users with reasonable means of travel. As a result, colonies may be reduced to research stations. A big step, back but necessary until fuel and transport become less expensive.

Antarctica, Siberia and Alaska have bloomed. Their large cities are now larger, with populations exceeding 1 million each. In the next 50 years we shall see substantial growth. It follows that climate control will have to be extended further in these areas.

As the urban sprawl continued, efforts were made to turn some of the deserts into lush woodlands. However, that proved to be a disastrous failure perhaps because nature was favored over technology. Large chimneys, over 1 kilometer tall, were built, surrounded by mammoth greenhouses that heated the air, which was sent up the chimneys at speeds of over 60 km/hour, driving large turbines producing electricity. The results were pathetic. The water table sank further creating sinkholes and depressions that made the land unusable. There is really no point in wasting any more money and effort on that project. We have forests galore since agriculture was abolished.

Some legal protection is required to shield isolated groups who have decided to boycott some of the changes of this century. Their major complaints were about having a single time zone for the world. They prefer to maintain their old local times. Furthermore, they continue to use months and weeks and observe 24-hour days. Surveys made show that their expectation of life is 80 years, which is less than two-thirds of the civilized world. They maintain the life and culture of around year 2000. In spite of the high death rates, very few individuals of these groups have moved into the civilized areas. They should be allowed to remain as they are, if only as a benchmark, or a control group, to test the progress that we

make in various fields. In one aspect we have not done well and that is proper utilization of leisure. Of course we are happier than they are. But we do find some of their music, poetry, and literature quaintly attractive. In another 50 years there will be an unabridged gulf between us and them. Until then, they need to be protected.

Lin went on to think about the other proposals but his cold continued to bother him. He thought he should put down the headings of the points that, he felt, should be included in the final draft. He noted:

Projections for 2051-2100

- Life span increase to 150
- Pre-work up to age 50; retirement at age 100
- Marriage age: 55
- First child at age 90, second at age 100
- Neuro-Surgeons implant chips in brain to allow change/upgrade of profession
- Chips implanted in brain to erase leisure memory after every 5 years
- All systems of medicines combined
- Eventually children to supply family support to aged parents
- Retired parents to actively participate in education of children
- Development of gardening in the Great Out Doors
- Deserts will be left alone
- Antarctica, Siberia and Alaska to show large increase in population
- Winding up of colonies on Moon and Mars

Lin suddenly stopped. "What if we find a cure for the common cold?" And got up to make another cup of tea. "And have tea with lemon?"

Lin recalled his mentaminder and began a note to his assistant, Reitet Dawna:

"Reitet,

Please prepare a cover memo for the attached report after soliciting comments and input from our committee members. When summarizing the report, please advise them that over 70% of the forecasts were correct. Also the last 50 years was a period during which no unimagined development took place like TV and computers in the 20th century. We may treat the last half-century as an exception. We should also mention that new sources of energy remain unfound as does the cure for the Common Cold."

Lin stopped writing and told Mary that the job was over. "Wonderful!" remarked Mary in her usual cheerful voice. "Now I can give you the lemons that nice, tall young man brought for you. He hand-picked these and brought them all the way from the Great Outdoors." She paused and smiled at the look of surprise on his face, "Yes, he sure did. And he's waiting in the other room for your memo. Be nice to him... please?"