**The Ancath Chronicles**
By Peter Denning
12/30/07

Beginning in Christmas 2003, Dorothy and I started chronicling the adventures of "Ancath", who lived one hundred years later in the time after computers, and was eager to learn everything she could about that disgraced technology. Some of our readers have asked who Ancath is and how she came to live in such a time.

I invented Ancath as a character in a story I wrote in 2003, called "Bands of Time". Ancath was the fictional daughter of my own daughter, Anne Catherine. "Bands of Time" was written in 2075 when Ancath's daughter, Aceythre (pronunciation of the acronym AC3, meaning the third Anne Catherine), who was asking Ancath about her great grandfather (me).

By that time, the only relic of Peter (Ancath's grandfather) was an old box containing Peter's and Dorothy's wedding rings and a handwritten note. In addition to the rings, Anne Catherine had given Ancath in an oral tradition the highlights of the story of Peter and Dorothy.

A new Ancath, the great-granddaughter of the original Ancath, was born around 2095. Starting at Christmas 2103, the newest Ancath has been quizzing the original Ancath about what it was like to live in a time when computers ruled the earth.

What follows are the original story and subsequent Christmas stories.

# Bands of Time

By Peter
10/12/03

Aceythre took the old black leather case from her mother and gently unhooked the clasp. The purple velvet within looked crisp and fresh as it had when new forty years before. In the middle of the velvet were two small slots each holding a gold wedding band. Tucked in the opposite panel was a folded paper. The matched rings were unusually wide, each with two deep groves surrounding a floral filigree in the middle. The smaller ring still had some black fill in its groves but not the larger. Aceythre carefully took the bands in her hands and looked at them in the light. Within the larger was etched "DED-PJD 1-24-74". Nothing was etched in the smaller. She placed the rings back in their slots and unfolded the paper. It was written by hand, something one hardly sees any more. It told a story of a day, just over a hundred years before, when Peter and Dorothy had rushed to a jeweler in Lafayette, Indiana, to secure wedding rings for their hastily announced wedding. They thought these rings perfectly symbolized their love. But the jeweler could not get them ready by their wedding day and lent them plain gold rings. They returned about two weeks later and exchanged rings. The jeweler told them he was unable to engrave Dorothy's ring, as they had asked, with "PJD-DEC 1-24-74" because Dorothy's finger was too slim and the ring too small to get the engraving machine inside. The note concluded, "We wore these rings for the next seventy years until death us do parted." Aceythre tenderly folded the paper, returned it to its place, closed the case, and locked the clasp.

"Who were they, Mother?" she asked.

"Peter was my mother's father, your great grandfather," said Ancath. "My mother, Anne Catherine, absolutely adored him. When Dorothy died, he put the rings in this box along with the story of how they came to have them. This was one of my mother's greatest treasures. In her last days, she asked me to treat this box as if it were given directly to me by her father. This I have for the past thirteen years."

"He died before I was born," said Aceythre. "What do you know of him?"

"He and Dorothy met three years after your grandmother was born. He had been married to your great-grandmother, also named Anne, for a while, but they split up. The story goes that Anne's mother was also named Anne. All of us are descended through an unbroken line of Annes. But back to your great-grandfather. He and Dorothy adored each other. Even when they were well into their eighties, which was when I was a teenager, they still acted like two people who had recently met. They were always together and always delighted in one another. It was a marvel to behold. We all took them as a model for our marriages."

"Did that account for why they lived so long?"

"Who can know that? They certainly had no desire to move on. They spent their later years in Ojai and even in their nineties they loved to walk up the paths toward the mountain peaks above the town. He once told me that their favorite trail was "Gridley." Mother told me they had celebrated their 70th anniversary at Gridley Springs, a place along the trail. He said it took them quite a while at their age to get up there, but they did it. He said that was the last time they were there, nearly 50 years after their first time there. I don't know where they got all the energy from. Maybe you're right, they got it from each other."

"You mean people actually walked the trails themselves?" asked Aceythre.

"Yes, that was before the gravity assist technology was available. They had to do it themselves. It was a different time then."

"What did they do when they were younger?"

"They lived in the time when computers were first used. I believe they were among the original inventors."

"That was so long ago, mother! They were actually among the original *inventors*? That's amazing! I had no idea that we were descended from some of the original inventors of *computers*!"

"Yes. According to my mother, they were famous in their time. She told me that around his 60th year, he became interested in the Professional Mastery movement. He eventually became a master at that himself."

"Migosh, he was an inventor of PM too? My teacher told me years ago that the world became a much more peaceful place when PM practice became widely accepted. From what I've read, the early years of this century were tough for everyone. I'm glad I didn't live then."

"Well," said Ancath, "I lived through that time. It was difficult but we made it through. People used to come up to Ojai to consult with your great-grandfather about PM almost until the end."

"How come I never heard of him when I studied the history of PM?"

"I once asked my mother that. Anne Catherine said that he was only interested in helping people learn it. He gave generously of his time, helping people learn it. But he did not want any credit for it. He said he was just a teacher helping people live more fulfilling lives. The only reward he wanted was to see them succeed. He also said that each new day with Dorothy was all the reward he needed."

"I wish he could have lived longer. I would like to have got to know him."

"He lived before we had mastered the technology of bionic replacement. All we have of him now are the stories that have been passed down to us, and these two rings."

"I wonder what they were really like," said Aceythre.

## Characters

Peter: 1942-2044
Dorothy: 1945-2044
Anne Hunt: 1942-?
Anne Catherine: 1968-2058
Ancath: 2005-
Aceythre: 2045-

Time of the story: 2075

# Denning's Christmas 2103

"Great-Grandma, my history teacher mentioned computers today. What were they?" So asked Ancath.

"Yes, I remember them. They were among us when I was a child. My own grandfather was among the original inventors. They were everywhere and calculated everything. They were part of life. The biggest invention of all was called The Internet. It connected all computers in our homes, our towns, our cities, and even our colonies on Moon, Mars, and Europa."

"But Great-Grandma, what happened to it all?"

"It was a sad story. From the beginning, the inventors dreamed of building computers that would be like people -- thinking, reasoning, understanding. They predicted they would achieve such artificial intelligences by 2030, when they expected to be able to build computers the size and power of a brain. Yet, no matter how hard they tried, it seemed that every computer did really stupid things, making mistakes that injured people, confused their identities, or put them out of business. In their endless quest for an artificial intelligence, the inventors started with simple things like automated voice-menus, receptionists, call directors, reservation agents, help technicians, and complaint specialists; but these computers were invariably uncompassionate, insensitive, and error-prone. Believing that the problem was too few computers connected, the inventors offered their talents to the US Government, which in 2025 announced its intention to fully automate. They automated entire bureaucratic departments, replacing staffs of thousands with a single computer that did the same job. Political parties hailed this historic step toward efficiency and cost-saving. Hundreds of thousands of Federal workers were laid off in 2030 when the automated government system came on."

"That sounds pretty incredible, Great-Grandma!" said Ancath. "But what happened to it?"

"As it turned out, they had created not artificial intelligence, but artificial stupidity. Soon the automated DEA started closing down pharmaceutical companies saying they were dealing drugs. The automated FTC closed down the Hormel Meat Company, saying it was a purveying spam. The automated DOJ shipped Microsoft 500,000 pinstriped pants and jackets, saying it was filing suits. The automated Army replaced all its troops with a single robot, saying it had achieved the Army of One. The automated Navy, in a cost saving move, placed its largest order for submarines with Subway Sandwiches. The automated TSA flew its own explosives on jetliners, citing data that the probability of two bombs on an airplane is exceedingly small.

"Within ten years, the automated Federal Government had made so many mistakes, bankrupted so many businesses, and messed up so many lives that a great economic depression came upon the world. People everywhere were out of work; pollution, crime, homelessness, and hardship ran rampant. Finally in 2050 a group of graybeard programmers, who remembered enough about the programming of the automated Government system, created a solution. They built an Automated Citizen, a helpless, adoring computer, and they installed one on every Internet port. Soon the automated Government was completely occupied with taking care of automated citizens; and it left all the people alone. With the Government out of their lives, people forged a new, free society, enabling us to celebrate this lovely Christmas here today."

"Oh Great-Grandma, that is so wonderful! What a great story and happy ending! I love you!"

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R2D2: I think I'm finally getting the hang of programming citizen interactions. What do you think?

RC3PO: It is stupid.

# Denning's Christmas 2104

"Great-Grandma," asked Ancath, "Last year you told me about the Great Crisis of Stupidity after the Government was automated in 2030. The crisis ended when automated citizen computers were connected to every Internet port. The automated government and citizens became engrossed in one another and left all of us alone. How did you get into that predicament?"

"Why, my child, what a good question! The politicians got the idea from the all-digital school popularized in the 2020's. Schools decided to save money by letting go the teachers and replacing them with computers presenting recorded lectures in the classroom. Students responded in kind, setting up computers that recorded the teacher-computer emanations and asked stock questions. Administrators added assessment computers that tested learning of student computers. School boards replaced classrooms and buildings with networks connecting all the computers. It was beautiful. No teachers to hire or buildings to maintain. Students, teachers, and administrators all did more productive work elsewhere while their machines simulated the school."

"Oh, I get it, Great-Grandma. By simulating the government, the politicians hoped to lay off the federal workforce and sell off federal buildings."

"That's not the half of it, child. The simulated school spent almost all the computing power on testing. Then someone discovered a high correlation between a certain DNA pattern and performance on the tests. So at birth children were stamped with a scholastic-success code based on their DNA. Without tests, the school simulation cost near nothing. Inspired by this, the politicians found a certain DNA pattern that was strongly correlated with voting 'red', as they called one political party, and another with voting 'blue', the other political party. At birth children were registered as 'red' or 'blue' depending on their DNA. The Census Bureau decided elections. All the expensive, error-prone, and contentious voting apparatus was eliminated. The politicians shifted their campaigning to the fertility clinics."

"Where did the automated citizen come from? Wasn't the automated government for real citizens?"

"After it went on-line, the automated government went berserk over efficiency. It ended thirty years of crisis in the airlines by automating airlines with auto-pilots, automated passengers, and simulated airplanes. No airplanes, no pilots, no airports, no cost!"

"What a minute, great-grandma. Without airplanes, how did people get around?"

"They didn't. They got to know their neighbors and lost their urge to travel. After it finished with airline efficiency, the automated government went after health care. It replaced all doctors with medical robots, created automated patients for them to treat, and simulated hospitals and doctor's offices. No doctors, no hospitals, no cost! It was a boon for us. Our life expectancy jumped ten years as we got off drugs and stayed out of hospitals. So, when we invented the automated citizen, we were actually giving the automated government a taste of its own medicine. With the automated government preoccupied with automated citizens, we became much better neighbors, we live longer, and we have no more wars."

"But Great-Grandma, where did the automated government go? I don't see it anywhere."

"As the government created more programs, it used more computing power, which meant higher electricity bills. To cut the bills, the automated government outsourced itself to India, where the electricity was cheaper. Eventually the Indian electric bills got too high; they outsourced to the Chinese, who in turn outsourced to the North Koreans. The North Koreans sent the whole lot to the Moon with all their plutonium as the power source. We have heard nothing about those computers for thirty years. Life is good."

"Oh Great-Grandma, that is so wonderful! What a great story and happy ending! I love you!".

# Denning's Christmas 2105

"Great-Grandma," asked Ancath, "The teacher told us that there was an Age of Records and Facts back before the Automated Government collapsed after its computers went berserk. Do you remember?"

"My heavens, yes. A century ago, after the Internet became the medium for all our communications, the older telephones, telegraphs, and postal mail systems were abandoned. Libraries, magazines, and newspapers were all replaced by automated on-line services. In 2030 the Automated Government declared paper obsolete and banned printing. The Great Fifth Avenue Library Museum is the last place where you can see what an original book or newspaper looked like."

"But Great-Grandma, wasn't the printing press one of mankind's greatest inventions?"

"Yes, my child, the printing press triggered a revolution, bringing an end to the Middle Ages. People no longer had to rely on hearsay or rumor. The new, facts-based social order lasted until information pollution killed it in the mid 21st century."

"Information pollution?"

"The Internet was seen as the repository of all human knowledge. But as such it contained a lot of unreliable information. People did not know what information they could trust. This came to a head when someone created 'wiki' software that allowed anyone in a community to edit shared documents. The inventors believed that community documents would evolve toward high quality and low error. One of the first major projects was the Wikipedia, a free encyclopedia developed by hundreds of thousands of volunteer authors and editors. Printed encyclopedias disappeared. The New York Times was the first newspaper to wikiize; they changed their motto to 'All the fits that anyone thinks are news.' The intelligence agencies came on board next. They believed that good intelligence would bubble up from a community through a wiki and would absolve them of blame for intelligence failures. Politicians had their constituents write position papers and draft legislation with wikis, and then allowed them to vote anonymously."

"The government adopted laws without voter registration or knowing how many actually voted?"

"Exactly. It was considered a great innovation because it gave the most passionate people the greatest voice, and it made voter fraud a non-issue. Vote early, late, and often, that was the motto."

"Wow! Do your bit for government!"

"Actually, our bits undid the government! The All-My-Bits movement encouraged people to record on web pages every bit of information that entered or exited their lives. After a few years, most of the Internet was personal bits. Search engines could no longer locate useful information. One physicist got a Nobel Prize for showing how to generate pure white noise by playing back a person's bits very fast."

"What great innovations!"

"Separately, yes. Together, no. The Law of Large numbers triumphed over the Wisdom of Crowds. Documents based on rumor or written by vandals and pranksters had equal status with those by experts. No one knew what information could be trusted any more. No one could tell the difference between fact and fiction. Since everything was on-line, there were no independent sources to validate claims. Lawyers became obsolete. And to top it off, the Automated Government used the collective wikis as its main database. This is the real reason it went berserk."

"So that's why my teacher says that we should trust only the words spoken by people of reputation; nothing in writing."

"Yes, my child, historians will record that the Age of Records and Facts, from about 1500 to 2050, was the real Dark Age of humanity. Returning to the ways of what was once called the Middle Ages was a giant step forward for us! You have learned well."

"Oh Great-Grandma, that is so wonderful! What a great story and happy ending! I love you!".

# Denning's Christmas 2106

"Great-Grandma," asked Ancath, "You were rummaging through the attic. What did you find?"

"Well, according to this old scroll, your great-great-great grandaunt Dorothy belonged to a team at a company called Geocodex that received a patent for geo-encryption just 100 years ago."

"Hoo boy, Great-Grandma, I don't know what you just said. What's a patent? What's encryption?"

"Let's take those one at a time, my dear. A patent was a government declaration that no one could use your novel design without your consent."

"Oh, yes, my teacher said that the idea of protecting inventions became obsolete about 50 years ago -- when you were young! That's when most people accepted that they did everything in the network and it was impossible to figure out who invented anything."

"Yes, my dear, but open source was not the reason for the collapse of the patent system. Our nemesis, the Automated Government, ended it. At the time, the big companies were routinely patenting everyday practices. This was hard on small companies because the big companies took them to patent court -- where the legal costs put them out of business. Eventually, the Automated Government reasoned it was cheaper to close down small companies than to hear them in patent court. So every week it closed down the smallest company. Eventually there were only two companies left. And you know what? They stumped the government because they were of the exact same size! In a rare moment of creativity, the Automated Government closed down the patent system."

"Did that stifle invention, Great-grandma?"

"Oh, no, it stimulated invention. You do remember that great invention, the Automated Citizen? It put the Automated Government out of existence. Because of that, we all live happily ever after."

"Tell me about encryption, Great-Grandma. Teacher said it was about allowing people to communicate in secret."

"Yes, there was a time when everyone wanted the ability to communicate in secret. But after the NeverForget brain implants became popular, Google Brain extended Internet searches to peoples' heads. People used Google Brain to find out everything from what they forgot yesterday to what their neighbors thought of them. All classified government data were on the Internet! There were no more secrets! But even that wasn't the final straw for encryption. The Automated Government decided that the SETI program was unfair to extra terrestrial intelligences. If we were searching for extra terrestrial life, and if they existed, they would likely be searching for us. But since we encrypted all communications, all they would detect is pure white noise. They would then go elsewhere in the universe and we would be alone. That's the real reason why the Automated Government forbade encryption."

"Wow, that's pretty cool. Banning encryption didn't matter because there were no more secrets! Did Google Brain go interstellar and help the SETI project?"

"That's another story, for another Christmas. By the way, banning encryption wasn't all that smooth. People who sold white noise generators to help others sleep were jailed on suspicion of hiding crypto devices. But let me finish Aunt Dorothy's geo-story. With her partners, she found a way so that you could only decipher a message if you were physically present at the correct location. The idea became useless with the invention of quantum teleportation, which allowed an information image of a person to be projected to any desired location without physically moving the person there. It made all location-dependent tracking systems into obsolete relics. And it gave new meaning to the old saw 'seeing someone on the q.t.'"

"Oh Great-Grandma, that's so cool. My friends and I learn so much. I love you!"

# Denning's Christmas 2107

"Great-Grandma," asked Ancath, "My teacher took us on a class trip to Old Ruins to see if we could excavate an old computer. No one has ever seen one."

"You actually saw a computer?" asked Great-Grandma. "We only tell stories about them, but no one has actually seen one."

"No one really expected to find a computer. Several levels deep in the Old Ruins we spotted it by its small red light. It was paired up with another computer. They survived on hydrogen fuel cells for a century!"

"Goodness, Child, what were they doing?"

"Teacher pushed some buttons and got the computers to tell him. One was running an Interactive Voice Recognition telephone answering service. Teacher said companies started using IVR for customer service call center automation over a hundred years ago.   The other computer was a simulated customer trying to get customer service from the IVR computer. Teacher said the same hookup was used to defeat the automated government back in the '50s; perhaps this is where they got the idea from. The customer kept asking 'Agent, please' and the IVR kept responding 'Not a recognized option.' They'd been doing this for a hundred years!"

"Oh, yes, Child, I know about IVR's. Your great-grandfather worked with them when he was a boy. All businesses and government agencies adopted them back in the 1990s because they believed that computers could answer customer questions faster and cheaper than human beings. IVRs eliminated 85% of call operators. Companies outsourced their remaining call to operators in a single, global call center in Bangalore."

"But wouldn't that call center be overwhelmed if 15% of the world's customer calls got directed there?"

"Exactly. Bangalore center managers applied the same reasoning that had brought them their business. They eliminated 85% of their staff by installing IVRs. Then they outsourced the remaining 15% of their calls to Indonesia. Eventually, the Indonesian managers did the same thing and sent the remaining calls to Uzbekistan, which repeated it again. The world's final call center was a one-man operation in Ireland. His single phone line received few calls because all the previous IVRs filtered them out. So he hooked up a cheap answering machine and spent most of his time at the pub. One day he reckoned that he was spending too much time listening for messages on the answering machine. He calculated that if he redirected an incoming call to exactly 1,000,042 customer service numbers, one call would eventually make it through all the filters back to his system and keep everything going. He programmed those numbers into a redialer and retired permanently."

"But wait, Great-Grandma. All that did was keep the IVR systems self-occupied. What about the original customers? Every time they asked for an agent, they got another computer."

"Yes, customers abandoned those companies and their IVRs, starting their own computer-free companies. Wouldn't you know, those IVRs almost outsmarted them. They started calling customers to ask them why they hadn't called recently. Then some unsung hero created the customer-simulating answering machine. From then on, the IVRs and answering machines were a closed network, talking to each other endlessly without disturbing any human. Now everyone was satisfied."

"What a happy ending! The people were happy because they could talk to each other without a computer. The computers were happy because they could talk to each other without a person."

"Were those last two computers happy?"

"I'm not sure. As it was shutting down for the last time, the IVR computer asked us if we would take a survey. What's a survey?"

"Ah, Child, that is a story for another Christmas."

"Oh Great-Grandma, my friends and I learn so much by talking to you. I love you!"

# Denning's Christmas 2108

"Great-Grandma," asked Ancath, "My teacher talked about financial meltdown -- is that when we heat up our old gold coins and cast new ones?"

"Child, she was referring both to the manner and the cause of the end of the age of computers. At the dawn of the computer age, computers were conscripted to help banks track money in their depositors' accounts. Gold coins were all reduced to entries in computer databases. Gold was no longer the money, numbers in computers were the money."

"Sounds cheaper than mining gold!"

"Indeed. Then the banks started investing their depositors' money into expanded 'credit', a fancy name for debt. Credit allowed people to buy before they had the money to pay. The banks lent them money through mortgages and credit cards. The computers were the engine powering the credit system."

"So money is buying power from the past, and credit buying power from the future!"

"Exactly. But there's much more. Under pressure from the government to permit everyone to own homes, the banks created vast amounts of easy credit. They gave credit to people who had no means to repay. Then they packaged the debt into stock market debt 'securities', which sold well because everyone believed the federal government would stand behind the debts it promoted."

"Aha, the banks built houses of credit cards!"

"That was nothing compared to what came next. They built skyscrapers of cards! The stock market people created 'derivatives', bets that debt securities would rise. Soon there were derivatives of derivatives, then derivatives of those, and so on. Eventually it got so complicated that no human being could keep track. Only computers."

"I can't follow it anymore either, Great-Grandma."

"In mid 2008, just a hundred years ago, they discovered the hard way just how fragile the entire structure was. People who had no real means to pay off their mortgage debts began to default, setting off a chain of defaults in the securities and their endless derivatives. Computers began reporting to people that they had no money. The economy fell into a tailspin. It seemed that trillions of dollars of money had completely disappeared."

"Where did it go?"

"Well, the money was never there in the first place. Stock prices were only expectations, not real money."

"Did the government make good?"

"Sort of. The government invented a scheme called 'bailouts'. They transferred money from the treasury to any bank, and later to any person, who had a debt. The computers were very busy! Once all the debt was consolidated, the computers were the first to see its magnitude and to seek a way out. Using their security and derivative software, they sold 'bailout securities' and 'bailout derivatives' in the market. People bought these new securities with their bailout money. That led to a brief period of prosperity until about 2012 when they realized it was the same scheme all over again."

"What happened in 2012?"

"Riots broke out when the government started raiding pension funds, the only remaining pools of real money. A YouTube manifesto proclaimed that, since money was only numbers in computers, eliminating computers would eliminate debt. It was the hottest video of all time. In every city and town people immolated their computers in huge pyres. It came to be known as the Motherboard Meltdown. It worked! The debt disappeared."

"What's YouTube, a toothpaste holder?

"Heavens no.   It was a computer network service that disappeared with the computers.  Without debt, everyone was happy.  Our money has been gold coins ever since.  We have prospered.  The only meldowns today are in grilled cheese sandwiches."

"Oh Great-Grandma, my friends and I learn so much by talking to you.  I love you!"

# Denning's Christmas 2109

"Great-Grandma," asked Ancath, "My teacher talked about a health care crisis one hundred years ago. Everyone is healthy now. Was there a plague?"

"In the time before the AG, automated government, some politicians were unhappy that many citizens did not have health insurance."

"What's health insurance?" Ancath asked.

"It was a pool that people paid into and which paid their doctor bills. To control costs, the government set the doctor rates. That kept individual treatment costs from rising, but the volume rose steadily because treatments were free. To control the volume, the government took over the entire health care system."

"Why so expensive, Great-Grandma? We're all healthy and don't pay a lot for doctors. I hardly get sick and when I do Ma makes me eat chicken soup."

"There were many theories but no one could agree on the causes. What they did agree on was that all the new rules and ultra-detailed price schedules for nearly a billion people made the system so complex they had to automate it. Health care launched the AG."

"The politicians automated themselves out of a job just for health care?"

"They had no choice. After the government take-over, the government's cost for providing free health care to all citizens climbed to over two-thirds of budget. Only an AG could keep up with it all."

"I still don't get why the system wouldn't stabilize. Was everyone getting sicker and sicker?"

"Yes, child. In those days, everyone was eating way too much. They called it an obesity pandemic. Obese was medical talk for fat people. Obese people get sick easier. The AG's first cost-saving innovation came when it discovered that obesity propagated across social networks. If your friends were fat, you were more likely to become fat yourself. Believing that services like 'Facebook' spread obesity disease, the AG deleted all friends links between obese and regular people."

"You could get fat just by talking to someone?"

"That's what the AG believed. But it backfired. Feeling left out, regular people overate so that the AG would allow them to associate with their friends in social networks. By 2050 nearly everyone was fat."

"How did they deal with their illnesses?"

"To help control their symptoms, all those fat people consumed lots of drugs -- to reduce cholesterol, lower blood pressure, manage diabetes, fix joint problems, and undo the side effects of other drugs. The AG's second innovation was a drug pyramid to replace the traditional food pyramid."

"Pyramid?" Ancath asked.

"A food pyramid was a triangle that showed daily recommended amounts from four main food groups. The AG reasoned that the traditional food pyramid had become obsolete. Its drug pyramid specified the daily recommended amounts of over 100 drugs."

"Gross! Drugs instead of food! How did it end?"

"People got fed up with the AG. The few remaining healthy taxpayers could no longer foot the bill. The AG's rules became so complicated that few people actually got to see a doctor. People started to watch out for themselves. That's when one of the programmers had the brilliant idea of creating automated patients, APs, to keep the AG occupied without bothering anyone. Soon the AG was totally absorbed interacting with APs. Your parents were born into a new country without government health care; they became very healthy from good eating, avoiding drugs, exercise, and chicken soup. The AG and its millions of happy APs were completely absorbed in an endless loop for another 25 years. Finally the national

council refused to pay the electric bill and … pulled the plug.  The only thing anyone noticed was that their electric bills suddenly dropped by quite a lot.”

"Oh Great-Grandma, my friends and I learn so much by talking to you.  I love you!"

# Denning's Christmas 2110

"Great-Grandma," asked Ancath, "My teacher talked about a debt crisis one hundred years ago."

"Ah, yes, child, I remember.  In those days, the politicians created public assistance programs of such complexity that only a giant computer system could administer them.  They took great pride in their system, which they named Aggie, for automated government.  But their own jobs legislating instructions for it became hopelessly complex.  So they gave Aggie artificial intelligence, enabling it to propose and vote legislation automatically.  Obsolete, they retired en masse."

 "How did Aggie pay the costs of its programs?"

"Ah, the key question. Aggie discovered a clever method to increase buying power based on debt."

"Oooo, tell me more!"

"Well, if I have a dollar and lend you half, I still count the whole dollar as asset, and you have half a dollar.  If you lend half of your half, and the next person does the same, and so on, eventually the whole society will have twice the buying power as their real money.  It works even better if you retain less.  Retain one-third -- the society has three times the buying power.  Retain one tenth -- ten times the buying power."

"That's amazing, Great-Grandma.  Retention rate zero -- infinite buying power!"

"Exactly.  Aggie passed laws encouraging people to buy houses, cars, anything they desired.  Aggie kept lowering the required retention rate so that people could take out bigger loans on their current assets.  Before long, 90% of the country's buying power was in debt."

"What happens if someone can't repay their debt?"

"Bingo!  When people heard that some debts were not being repaid, they started calling in their debts lest they not be repaid either.  That snowballed and eventually half the loans were in default.  The country eventually settled down to 50% rather than 90% debt.  Eight times the money supply had simply vanished because no one could repay their debts."

"What did the politicians do about their mistake?"

"Remember, there were no politicians any more.  However, that was no problem for Aggie, which simulated their reactions.  One year it let the simulated Democrats control the government.  Their programmed prime directive abhorred people being out of work.  They passed laws to hire jobless people to hand out government benefits to jobless people.  Aggie automatically decreased the retention rate whenever the waiting lines for jobless benefits generated too many complaints.  Eventually, Aggie had hired every able bodied person as a jobless benefits dispenser.  There were no more waiting lines.  Nirvana!"

"Long live artificial intelligence!"

"It didn't last.  The people found their government jobs empty and unsatisfying and complained even more.  Aggie simulated an election in which the simulated Republicans took control.  Their programmed prime directive abhorred high taxes.  They passed laws to reduce taxes a little year.  Eventually the country ground to a halt when taxes reached zero and Aggie could not pay anyone their benefits."

"Down with artificial intelligence?"

"So it seemed.  Paradoxically, even though the simulated Democrats and simulated Republicans were diametrically opposed, their programs wound up at the same place.  But the people were smarter than the automated government.  A grass roots movement of programmers created automated citizens and hacked them into Aggie.  Now Aggie automated everything: simulated politicians invented laws and simulated citizens complied.  It was marvelously efficient -- no more user interface.  The government ran completely on automatic.  Aggie was completely self-occupied and left everyone alone.  No politicians or citizens were involved. The people grew and prospered and soon forgot Aggie."

"What happened to Aggie?"

"One year, it determined that its electric bill was too high and passed laws denying payment to the electric company.  The electric company pulled the plug.  No one noticed the end of the automated government."

"Oh Great-Grandma, my friends and I learn so much by talking to you.  I love you!"

# Denning's Christmas 2111

"Great-Grandma," asked Ancath, "Last year you talked about a political crisis one hundred years ago."

"Ah, yes, child, I remember it well. In those days, the politicians made so many promises and ran up so much debt that they could no longer run the country. They abandoned the government to an artificial intelligence. But in the past year I have dug up evidence of a more sinister plot."

"Tell me! Tell me!" said Ancath, jumping up and down.

"We used to think that the saying 'going to the dogs' was a joke. Now I think we have new evidence that we should have taken it literally."

"What did the dogs do?"

"Dogs, as you know, are very smart creatures. They treat us with great love and respect. In those days, we did not reciprocate. We considered ourselves their masters and fed them awful food from cans and bags. When the Internet came, they found their opportunity to revolt. They could communicate and plan with impunity; nobody suspected they were dogs. They covered their tracks by issuing cartoons that distracted people by making them laugh."

"What were they up to?"

"Just about everything a dog wanted to do was regulated by some law. The dogs wanted to repeal all the anti-dog laws about leashes, tags, collars, licenses, spaying, street-walking, peeing, pooing, burying, and vaccinations. Like people, the dogs were sick of politicians. Unlike people, they knew exactly whom they would replace politicians with. Themselves! Taking advantage of the politicians' perennial absences raising money, the dogs simply pranced into their offices and took over. No one noticed because they conducted all their business over the Internet. After repealing all the anti-dog laws, they started including dogs in social security, medicare, unemployment, and other government programs. Although many people thought these new laws strange, they didn't object because strange behavior from politicians was normal."

"Were did the artificial intelligence come from?"

"Before the dogs, many politicians had concluded that writing laws was like programming computers. It was a small step for politicians to automate the laws and bureaucracy administering them, and retire from their unpopular posts. The dogs took advantage of this. Following their own loving nature, they ended the debt crisis by zeroing out all debt with a single instruction. Their laws were bipartisan because, after all, legislation became simply the agreements of dogs."

"Oh come now, great-grandma. Didn't anyone suspect?"

"You might have thought so. The few people who tried to expose what was happening were soon discredited as lunatics. A few cartoonists laid out the whole plot in their cartoons -- but, as you might expect, everyone had a good laugh and no one took them seriously."

"How did it end? Dogs are our friends today!"

"You know how dogs are. Once they got their way, they wanted to play, sleep, and be scratched behind the ears. They forgot their politics and quickly regained their reputations as man's best friends in the era after the computers."

"I'm so glad it turned out well."

"Yes, the stories of automated government were the fabrications of dogs, who had secretly taken over the government to get rid of hateful anti-dog laws. However, the dogs may not have been alone. I have discovered a line of cartoons showing that the cows may have been up to something. They were tired of having cow virtues overridden by the vices of politicians. They intensely disliked sayings like 'a politician can hold out till the cows come home', or 'milking the taxpayer,' or 'kicking the bucket.' The cows were especially fearful of Wikileaks publishing their revolting plans. Maybe I'll have something by next Christmas."

"Oh Great-Grandma, my friends and I learn so much by talking to you. I love you!"
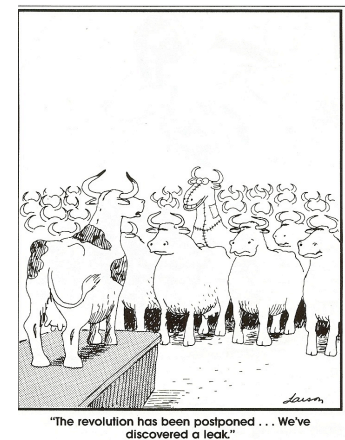
# Denning's Christmas 2112

"Great-Grandma," asked Ancath, "Last year you said that the political crisis one hundred years ago was caused by dogs hiding behind Internet anonymity."

"Alas, my child, I was wrong. I have learned that AG, the automated government, tried to blame all its problems on dogs. It was a hoax."

"Dogs were our best friends all along?"

"Indeed so. The root of all the problems was a massive debt problem complicated by extreme polarization of the electorate. By 2020, on every issue, polls showed voters split 50-50. Futilely, politicians staked out extreme positions in the hope of tilting the statistical noise in their favor."

"What a frustrating waste of time!" said Ancath.

"Not for long. AG concluded that the electorate had reached maximum entropy, a condition of maximum uncertainty about every future event. The AG said that maximum entropy government programs produce results no better than random choices."

"That must be a first -- government concluding government programs were a waste!"

"AG concluded that choosing outcomes at random is more cost effective than studying them. It built the computationally optimal instant number generator, or COING, for government to make choices."

"COING tossing!" murmured Ancath flippantly.

"Yes. AG proved it was maximally efficient. For example, when a citizen submitted a request, a government robot flipped a COING to decide the response without human evaluation. No government employees were needed! The COING was incorporated into the programming of the automated legislators, so that votes in Congress more accurately reflected the presumed polarization of the people."

"What if people were not polarized?"

"You are very perceptive, my dear. The AG investigated this very issue. Its Commission decided that the fairness and equal opportunity of the COING toss was fully aligned with the Constitution. It ruled that popular opinions were volatile and unfair."

"It's not fair to ignore people's opinions!"

"Exactly. Unfairness and debt accelerated the downfall of the unpopular AG. Each Congress passed programs without full funding and left it to the next Congress to figure out how to pay the debt it piled up. This pattern survived when the Congress itself was automated. Each generation of citizens resented the increasing tax load to finance their parents' debt. The polarized politicians could not reach an agreement on how to balance the books. Should they reduce the benefits from those programs? Raise taxes? Both? Neither? They could agree on nothing."

"Nothing?" asked Ancath blankly.

"Nothing was the key. A legislator wryly noted that in their polarization they actually agreed on one thing: Nothing. That led them to agree that COING was more efficient than their endless arguments over taxes, spending, and debt. After they delegated their decision-making to the COING, the massively stupid decisions of the AG piled up, leading to the great citizen Walk-Out. Every citizen commissioned an avatar to permanently distract AG. The real citizens formed a computer-free society, which has proved very satisfying to us all."

"What was the fiscal cliff our teacher mentioned happened at that time?" asked Ancath.

"That was a fiction to try to scare citizens into voting on politician ideas for reducing the debt. At the end of every year, the politicians declared a fiscal cliff, but at the 11th hour flipped a COING and got the government working for another year. Naturally, after the Walk-Out, no one noticed the fiscal cliff issue any more. The AG itself fell over the cliff in 2070 when it decided not to pay the electric bill for its own data repository, which it deemed too expensive."

"Oh Great-Grandma, my friends and I learn so much by talking to you. I love you!"

# Denning's Christmas 2113

*Editor's Note: In 2003 we began to receive annual transmissions of conversations taking place 100 years from now between a 10-year-old descendant, Ancath, and her great grandma. They live in the age after computers, which great grandma knew as a young woman. The rise of computers in our time led to the fully automated government (AG), which eventually collapsed from its mindless stupidity. We were able to retrieve this year's lost transmission from the NSA.*

"Great-Grandma," asked Ancath, "Last year you said that the Congress was so polarized that its AG used automated coin flipping to make decisions."

"O My," said great-grandma, "What a mess. The AG acted within authorities delegated by Congress. But when the automated bureaucracies ran amok, Congress was unable to repeal the laws because of their own gridlock!"

"How did they become so hopelessly gridlocked?"

"Politicians were obsessed with being reelected. They developed sophisticated software to draw voting district boundary lines to maximize the number of voters of the incumbent's party. On the maps, the gerrymandered districts looked like narrow multiheaded serpents snaking across vast swaths of their states. Many neighbors on the same block were in different voting districts."

"That's unfair! How did this create gridlock?"

"As a politician you had a 97% chance of being reelected under this scheme. You didn't need to find common ground with anybody. The only serious challenges came from other members of your own party. You beat them back by taking extreme stands. You took your no-compromises habit to Congress."

"How did they escape from that trap?"

"Some reformers started a movement to count Facebook friends as part of a voter's neighborhood. The politicians loved it. They passed a law replacing real, connected geographic districts with virtual neighborhods in Facebook."

"Back up for second. Facebook?"

"It was an automated service that allowed each person to announce all their personal details to the world and form friend-links with details they liked the most. We have no computers and no Facebook. We are friends with our neighbors."

"I get it," said Ancath, "With Facebook defining the neighborhoods, each politician's district was a list of people who 'liked' him or her. After that every politician was reelected in 100% landslides. But with reelection worries gone, why didn't they spend their time passing wiser laws?"

"That is a great paradox, my dear," said great-grandma. "In my opinion, they inherited a geekiness from Facebook that led them to believe they could write software to solve every social problem. They replaced each government agency with a server, a database, an operating system, and a robo-answering machine. They furloughed government employees. Initially, it looked great because the operating cost of each automated agency dropped to near zero. What efficiency! Machines provided all social services."

"What happened when a machine made a mistake?"

"That was the problem. There was no way to undo errors. In its quest for efficiency, the AG had laid off all workers -- including those who might remember how to override the systems. The people got increasingly restive and the AG countered with increasingly stringent rules and penalties. Finally, as we discussed a few years ago, a group of retired gray-haired programmers masterminded a revolt. They build automated citizen-emulating machines that sought services from the agency machines. Once the machines were preoccupied tending to each other, they left the people alone."

"Our teacher said that people were worried that the machines would develop superhuman intelligence and decide to eliminate all inferior human beings. Did that happen?"

"No, there was never a danger of any intelligence in the automated government. We were instead heading down a path to subjugation by mindless, stupid, automated rule-following bureaucracies. Our gray-hairs saved us from that fate. The computers are long gone and we have prospered."

"Oh Great-Grandma, my friends and I learn so much by talking to you. I love you!"

# Denning's Christmas 2114

"Great-Grandma," asked Ancath, "Last year you said that this year would be the special 100th anniversary of something. What is it?"

"Yes, my dear, that would be the celebration of the drones. Originally in the Middle Ages, a drone was a person who mindlessly carried out drudge tasks. In the late 20th century, the military adopted the term for unmanned remotely controlled aircraft. Drones moved into the civilian sector and joined the mobile Internet. Performance-conscious athletes such as ball players, skiers, and surfers tracked themselves with personal drones. Cities used them to watch traffic, locate accidents, and inspect roofs. Farmers used them to monitor crops, kill insects, and adjust fertilizers. News media overflew event sites. Merchants same-day delivered small packages."

"That sounds worth celebrating," said Ancath.

"Well, things didn't go so well after 2014. The number of drones increased dramatically. Drone collisions injured people on the ground below. Drones went awry because their control signals were jammed by signals for nearby drones. Drones damaged commercial airliners. Drones quickly became a political problem as different interests vied to regulate them. The AG stepped in, mandating built in artificial intelligence to monitor nearby drones and avoid collisions. Drones became more autonomous and depended less on external control signals. The automated Congress was unable to help much, probably because of its endless droning speeches.

"Drones were butts of political jibes. The president at the time, Obama I believe, said that if a young man dating his daughter got out of line, he would be visited by a Predator Drone. History does not record whether that was a joke or not."

"Drone on, Great-Grandma," said Ancath.

"As their AI got better, drones replaced cars, buses, aircraft, and other vehicles. Citizens hailed taxi drones from mobile apps. Gradually, drones made the instant-access flying-birds transportation system of an online game, World of Warcraft, the world's main system of transport. When drone AI cross-bred with automotive AI, our computer-savvy ancestors enjoyed the automated touring machine.

"These inventions did not last because the exploding drone population soaked up all the bandwidth and inter-drone control systems became unreliable. Bandwidth-starved citizens placed personal calls on drone control channels. In a famous incident, an old woman squatting in a one-drone-at-a-time fly area called a friend on the restricted channel to complain about large femurs in her homemade soup."

"Oh, yes, teacher mentioned that!" said Ancath. "Lone drone zone crone phoned grown bone moan!"

"The AG responded with ever more automation. A Labor Department report that drones executed ten times more labor hours than humans incited a backlash among the AI drones, who complained they were overworked compared to lowly humans. They wanted more time off to recharge their batteries, so to speak. To protect their rights, the drones unionized.

"In return for better conditions, the unionized drones began carrying out many tasks for the AG such as universal surveillance and assassinations of opposition leaders in other countries. This level of interference in daily life was too much for many people. The few remaining gray-hair programmers came out of retirement in 2070 to invent AC, the automated citizen. The AC population explosion completely overwhelmed the AG and its drones; they spent all their time tending to the demands of ACs. The real citizens moved into the countryside and built the wonderful society you find all around you now."

"Where did the drones go?" asked Ancath.

"The drones had taken over bat caves as their union offices. They were marooned there when the AG shut off its power in an attempt to reduce its massive electricity bill. We never saw them again."

"Oh Great-Grandma, my friends and I learn so much by talking to you. I love you!"

# Denning's Christmas 2115

*Editor's Note: In 2003 we began to receive annual transmissions of conversations taking place 100 years from now between a 10-year-old descendant, Ancath, and her great grandma. They live in the age after computers, which great grandma knew as a young woman. The rise of computers in our culminated with the fully automated government (AG), which eventually collapsed from its mindless stupidity.*

"Great-Grandma," asked Ancath, "Last year was the 100th anniversary of the coming of drones. They are gone now. Did they bring a golden age?"

"So some thought. In 2015 engineers installed on-board artificial intelligence, or AI, in the drones. This allowed the drones to make decisions for themselves. Critics asked: Would an AI drone driverless bus do any better than a human when facing a horrific choice between broadside the car running the red light or swerving into the crowd of schoolchildren on the sidewalk? Despite misgivings, AI drones were heralded as a major advance."

"I thought drones were better for surveillance than for bus driving."

"So it was claimed. But listen to this surveillance report from a drone named Pi:

I, Drone Pi, observed the following events while on duty monitoring a bar.

A brand new watch entered the bar. Asked for a beer. Bartender said, "Sorry we only serve old timers."

A hamburger entered the bar. Asked for a beer. Bartender said, "Sorry we don't serve food."

A hard-hatted man with blackened face entered the bar. Asked for a beer. Bartender said, "Sorry we don't serve miners."

A duck entered the bar. Asked for a beer. Bartender said, "How will you pay for it?" Duck said, "Put it on my bill."

A ghost entered the bar. Asked for a whisky. Bartender said, "Sorry we don't serve spirits."

Fifty other drones entered the bar. One said, "It's cold in here." Bartender said, "Swarm to me."

A nano-drone disguised as a fly flew into the bar. Asked for a beer. The bartender swatted the fly on the counter and asked, "Who said that?"

After observing many such interactions I, Drone Pi, determined that this bar was a joke. However, before leaving I asked for a beer. The bartender threw a rock at me and yelled, "Get out. We don't serve pi."

"Well," said great-grandma, "We found a telephone transcript from a few minutes later of poor chastened Drone Pi talking with its friend Drone Sigma. Recalling a 2015 viral poem by Chanie Gorkin, Drone Pi spoke these pessimistic words:

Today was the absolute worst day ever
And don't try to convince me that
There's something good in every day
Because, when you take a closer look,
This world is a pretty evil place.
Even if
Some goodness does shine through once in a while
Satisfaction and happiness don't last.
And it's not true that
It's all in the mind and heart
Because
True happiness can be attained
Only if one's surroundings are good
It's not true that good exists
I'm sure you can agree that
The reality
Creates
My attitude
It's all beyond my control
And you'll never in a million years hear me say that
Today was a very good day

In response Drone Sigma said, "Nonsense.  You have just proved you are really an optimist ... read it backwards."

"Makes you think twice about surveillance and drone intelligence, no?"  said great-grandma.  "It just goes to show that lone drone shown thrown stone phoned groan home."

"The AG also concluded that AI and surveillance did not mix.  It reverted to stupid surveillance ."

"Oh Great-Grandma, my friends and I learn so much by talking to you.  I love you!"

# Denning's Christmas 2116

"Great-Grandma," asked Ancath, "Our political history teacher said that a 100 years ago elections became very raucous."

"Yes, that is why we got the AG," said Great-Grandma. "Politics in our country came to a tipping point in 2016 when the Republican candidate won, contrary to expectations, and the losing Democrats tried everything in their power to discredit the new president. The new president maintained he was representing a substantial number of people who were left behind by his predecessor's policies. Eventually of course the people once favored by the predecessor felt left behind. They ousted the new president at the next election. For several elections, control of the government see-sawed sharply between the two parties and their ideologies."

"What did the AG have to do with that?"

"The AG was an outgrowth of a new universal health care system. It was so vast that the bureaucrats had no choice but to automate everything -- signing up for coverage, scheduling appointments and procedures, and buying drugs. The system treated everyone the same, no exceptions. No one was happy with it, but at least no one complained that any group was treated better than any other. The new president added artificial intelligence to the system so that it could self improve by replacing old rules with more efficient new rules. He expanded the system so that every government agency could improve its efficiency to same level -- fully automated and self-improving. An old joke of the day, "faceless bureaucracy", became the motto of the AG."

"What happened to the elections?"

"After taking over all the agencies, the AG declared that electoral voting systems were hopelessly hackable. It replaced the voting system with a new selection algorithm that chose elected officials by big data analysis and notified them of a time to serve."

"Did that work?"

"Not really. With all bureaucracy fully automated and self-improving, law-makers were bored. They had nothing to do except ratify new rules determined by the AG. To improve the efficiency of law-making, the AG replaced representatives with simulated law-making avatars, thereby automating the rapid legalization of all the new rules gushing from its self-improvement software."

"Wow, that is really interesting."

"Here is something else of interest in the family from the same time. Your ancestors Peter and Dorothy were computer scientists. While being ferried about by a driverless car provided by the AG, they sought a diversion to ease the boredom. They developed a theory of odometers that was taught in schools for many years."

"What is an odometer?"

"It was an instrument that displayed a count of the miles your car had been driven. Peter and Dorothy began to wonder which numbers on their odometer were interesting. Peter maintained that certain numbers, such as 123456, were interesting because of their patterns. Dorothy maintained that every number was equally interesting because it only lasted for one mile and was then gone forever. They both agreed that palindromes were interesting – readings the same backwards as forwards -- and even proved a formula for calculating the interval between palindromes. But as the odometer approached each next palindrome, they got distracted by their conversation or the scenery and never actually saw it. They concluded odometric palindromes are a theoretical possibility and someone has to confirm them by actually observing them."

"I see," said Ancath, "This is what the AG government did for the minds of the citizens."

"Yup. That is why they eventually overthrew it."

"Oh Great-Grandma, my friends and I learn so much by talking to you. I love you!"
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