The Cradle of Life

I am the dream god
that which I dreamed
is now reality
I was asleep
but am now awake
I have dreamed myself alive

It was a sunny day at the campus. Hundreds of would-be students streamed from the entrance to the main building to attend the introductory speech here on this open house day. On the way they passed the logo of the NanoTech university which was an exclamation mark shaped out of a buckyball topped by a carbon nanotube. The university was financed partly by the government and partly by the NanoTech company that thus had a say in the direction of research, but otherwise it was like any other public university. Many of the students would naturally end up working for the NanoTech company after graduating since the programs of education was aimed at this type of industry, but were free to pursue any other job. All research was published in public domain, being available to society as a whole. All in all there was something in it for the government as well as the NanoTech company.

Inside the main building in the auditorium Adrian Zoey was waiting for the guests to find a place to sit, and then again for everybody to stop talking. He had volunteered this year to give the welcoming speech which per tradition was given by a leader of one of the institutes on campus. Adrian was leader of the institute of Artificial Intelligence and as such qualified for the job. When the auditorium was finally silent Adrian began his speech.

Welcome all. The speech I am about to give is an introductory speech, but I will not be giving you an introduction to the institutes or even to the university itself. You can get that later when visiting the institutes. Instead I am going to tell you a story. It is a story about technology, about amazing achievements, and about our hopes for the future. Our story begins around the start of the millennium when the computer was in its childhood days. Back then the so-called office computer was the main source of processing power whether you needed to do office work, science projects or play a video game. It was also the time of the super computer, which was basically an array of office computers working in parallel to create more processing power. As the average office computer was the size of a school bag, so an array of 1000 office computers would easily take up the space of an entire room. This all changed with the parallel processor, when it became possible to stack circuits on top of each other, basically going from 2D to 3D inside the chip. The parallel processor was a giant super computer on a chip, revolutionizing the processing power of computers.

In the meantime scientists were trying to understand the working of organic cells, especially the ones found in the human body. Cells were scrutinized by microscopes and advanced chemistry, and we even learned to decode DNA. But the real breakthrough came when we learned to scan the cell by use of certain particle beams in 3D and real

time. And with the help of the parallel processor it became possible to process the enormous amounts of data needed to model the workings of a cell to nano precision. A number of applications opened up, most significantly the ability to cure previously uncurable diseases.

But understanding was one thing. The possibility to manipulating the cells was another. Numerous modelling tools were developed for predicting the influence of certain stimuli to cells such as adding chemistry or changing DNA, and so the field of bio-engineering was born. Through bio-engineering we were able to grow advanced crops, fight harmful insects and cure more diseases, but the holy grail was still beyond our reach: To stop the aging process of the human body. It was believed (and it still is) that the right arrangement of genetic coding could yield an immortal body, but the number of possible coding sequences is so huge that even with the computing powers of today, convention computing would not be able to sort through the sequences to find a working sequence before the end of the world. Conventional computing.

But nature has provided us with another type of computer which through the help of intuition is able to eliminate huge quantities of sequences in an instance. The human brain. The process is not without errors, but through learning, logic and intuition a human brain can accomplish things that conventional computers cannot. The human brain however was never optimized for solving scientific problems. But we can mimic the neural networks of the brain to create a computer that is. And we have.

At my institute we have such a computer, an artificial intelligence based on a mixture of neural networking and logical circuits, an AI that can think and learn from its mistake. Programming such a computer for a specific purpose takes time, but we have been working on it for years, and now the time for harvesting the fruits of our labour draws close. Ladies and gentlemen, this is going on as I speak. Let me end this speech by saying: "What an exciting time to be alive". And you who are visiting today have a chance to become part of it. And now it is time for answering some questions you might have.

Adrian looked at the audience and saw a few raised hands. He started picking at random. The first question was a boy who wanted to know if the AI was dangerous, if it could become self-aware and try to seize control of society. Adrian said that 'self-awareness' was not part of the construct, and that the way the AI was programmed and wired it was aimed at solving a specific scientific problem and not able to seize control of external units. But he agreed the question was valid and that care should always be taken when working with AI. He answered some more questions of a technical nature and a few practical ones before ending the session. The audience left the building and headed for other parts of the university. Most of them had a lovely day and went home with their heads full of information and new impressions.

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Two months later the scientists and programmers were hard at work at the institute of artificial intelligence. They had just finished the last of the programming of the AI and was entering the phase of bug hunting. As was to be expected the code didn't work right out of the box. It had to be cleaned of bugs, and then possibly refined. This process could take

weeks or even months. It therefore came as a surprise when after a week as Adrian was testing the code the screen said “working”, and various output values appeared underneath.

“Is it working?” his colleague Valerie Gervais asked.

“It appears so.” Adrian answered. “The numbers look fine, but it is too early to tell if it works the way it should”.

“Do we keep it running?” Valerie asked.

“If we go by the book we should stop it now and do some more code testing. But the numbers look good, so I say let it run for a week to see how it goes and if there are no results by then we shut it down”. Adrian spent the rest of the day looking at the output, but the only indication he got was that the AI was probably doing what it was supposed to, working hard on finding a genome that would fulfill the given criteria. With neural networking though it was impossible to give estimates of how long it would take, and it was not a given that a solution existed at all.

Adrian woke up early the next day, unable to sleep further. He decided he might as well go to the institute and check up on the computer. As he turned on the screen he expected the list of ever changing outputs showing that the program was running. Instead he was met with the words: “Genome found!” He was stunned, but thrilled and excited at the same time.

The first thing he did was copying the genome to his personal data account. He didn’t want to lose the data due to some silly mistake. Then he went to the institute of bio-engineering to analyse the genome. Naturally the institute was closed this early in the morning, so he sat down on a bench outside the entrance waiting. The first one to arrive was surprised to see him, but let him in, and he had a cup of coffee while waiting for the right people to get to work. He addressed Bill, a senior employee whom he had worked with before.

“Our computer spat out a genome that I want to analyse in detail to see if it is indeed a valid candidate for what we are looking for”.

“First we need to simulate the workings of various cell types containing your genome to ensure that the cells are stable. If not then the genome won’t work”.

Bill ran the tests and concluded: “Well the cells do go through some sort of transformation but seem to stabilize at the end. I would call that a success. Next step is applying the resulting cells to a human body in our simulator. We will start out with a fertilized egg cell to see what might come out of it”.

There was a picture of the egg cell on screen slowly dividing into first 2 cells, then 4 then 8, and while the cells kept dividing some numbers on the side showed the status of the organism. After a while it was impossible to see the individual cells. A small fetus started to emerge.

“The uterus environment is easy to simulate”. Bill said. “Once the baby is born it becomes another matter. We have to simulate periods of sleep, periods of exercise, periods of rest, intake of food and liquid, output of poop and urine, breathing, sweating and various other factors. We assume a simple environment such as constant temperature, humidity and air. We cannot simulate every atom in the body or even every cell, so we have to simplify things a bit as you know. The simplifications only work on something close to a human being. With this in mind let us continue the simulation”.

The fetus developed into a baby, the baby to a child, and the child grew into an adult. The age of the being was displayed also, and it seemed to fit the images nicely. As the age reached 80, Bill stopped the simulation. He displayed some graphs and numbers.

“Look”, Bill said, “these are aging characteristics. The all flatten out around the age of 15-20. This looks very promising indeed. I would say you are on to something”.

“I didn’t expect results so soon”, Adrian said. “This exceeds all my expectations. I would open a bottle of champaign but I have to write a paper on the project and the results”.

Adrian decided to write a summary paper. The world could not wait for him to spend weeks on a report containing all the little details of this huge project. But even the summary paper took him all day to write. Not least because half the university had to stop by his office to congratulate him. As he went to bed that night his head was buzzing, but he was happy and fell asleep quickly.

Adrian woke up by the sound of his comm device ringing. He quickly got dressed and then answered the call. It was from a newspaper.

“Is it true that you have discovered eternal life?” the journalist wanted to know.

“Well”, said Adrian and was about to explain when the doorbell rang. Adrian excused himself and went to answer the door. When he opened he saw a woman with a microphone and a guy with a camera.

“My name is Jill and I am from channel 4”, the woman said. We would like to invite you to our studio in the city in order to interview you about your recent discovery. All expenses paid of course.” Adrian thought about it for a second.

“Well I guess that would be my duty as leader of my institute, to explain my results to the public. But you must understand that my research is in no way mature enough to provide any final conclusions, let alone services to society”.

“We understand”, assured Jill the journalist, but Adrian sincerely doubted that. Nevertheless, after about 3 hours Adrian found himself in the studio of channel 4 answering questions on live television.

“So, what a discovery”, said Brian the tv host. “Answer me this Adrian Zoey, will we be able to live forever?”

“You must understand”, said Adrian, “that the results are just preliminary. There will have to be lots of laboratory tests, simulations, confirmations to ensure the solidity of the genome, and even if and when all this is in place, you cannot just change the genome of an existing organism. What you can do is replace the genome in the fertilized egg cell of a human being”.

“So what you are saying is that we will have children that are immortal, but the people who are alive now will die out?”

“Did I say that?” Adrian asked. But the commercials had already been announced.

Adrian woke up to a new day at the hotel room. He showered and got dressed to prepare for the trip home. There was still about an hour before he would be picked up. There was a knock on the door. He opened the door to see a woman maybe in her 30’s or 40’s and a muscular man somewhat younger.

“Mr. Adrian Zoey?” Asked the woman.

“Yes, that is I”, he answered.

“You may not know me, but I am Trisha Antoniette. This is Danel”, she said and indicated Danels presence with her hand. “We are from the interplanetary counsel, and we would like to discuss some things with you. It seems you have stirred up something by your performance last night. If you will allow me to show you..”

Trisha held up a reader that showed this mornings news. The headlines read: *The super babies and the old goats*. Adrian was confused.

“I never said anything like that”, he said. “But, what is the interplanetary councils interest in me?”

“We’d like to help, and we think you need it. And we think you can help us. But we need to go to a safe place. Your room is probably bugged”.

“Bugged? But, what happened…?” Adrian said.

“Politics happened”, said Trisha, “now, let’s get going. We have things to do before it is too late”.

It was afternoon when Adrian arrived at the campus. As he stepped into the doors of his institute he was met with Valerie. He was about to greet her when she stopped him.

“Before you say anything, I have to tell you something”, said Valerie. “Some representatives from the government arrived this morning, and we came to an agreement about various issues. As a result you are no longer leader of the institute. You have limited access to the resources of the institute, but you are welcome to keep working for us under these new conditions. In fact, as the new leader of the institute, I would very much like you to continue working for us. The directions of research have also switched somewhat. Please understand that there is nothing personal behind these decisions”.

“That was quite a mouthful”, said Adrian. “I am grateful for your decision to keep me in the institute, but to be honest I have other things to do”.

“May I ask you what that is?” asked Valerie.

“Well I always dreamed of writing science fiction”, Adrian said with a smile. He then left the institute and walked to the campus’ parking area. He walked over to a car there, one of the doors opened, and he got in.

“They have restricted my data access as you said they would”, he said.

“Luckily we got the data in time”, said Trisha. “What luck that we happened to be on Earth when all this happened. Now, off to the spaceport we go”.

Adrian had been on the Starfish for a few months when he was called into the communication room. He sat in front of the big screen, and the familiar face of a woman he had seen before emerged on the screen.

“I know you are not there yet, but allow me to say: Welcome to Europa. We have already started construction of the facilities that are going to house your research. While they are being built you will be placed in some vacant rooms we had, that will work as temporary laboratories. Your new staff is looking forward to meet you Mr. Adrian Zoey”.

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About 3 years later on Europa, Danel came home from work with an orchid in his hand. He rushed in to Trisha and handed her the flower. She smiled and placed it in a tall vase. She looked at him, still smiling.

“Have you thought about a name, or is that too early?” Danel asked, smiling back at her. She stared with an empty glance at the flower Danel had brought her, and sat there for a while, then suddenly she said: “What about Orchid?”

“That’s a good name”, said Danel.