

# TEN TALES ON SYNTHETIC BIOLOGY

A POSITIVE VISION

Valencia Biocampus iGEM 2013



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# TEN TALES ON SYNTHETIC BIOLOGY

Valencia Biocampus team attending the 2013 iGEM competition  
Universitat de València



“Dr. Rob Carlson is a Principal at Biodesic, an engineering and strategic consulting firm in Seattle that provides services to governments and corporations around the globe. Carlson is the author of the book *Biology is Technology: The Promise, Peril, and New Business of Engineering Life*, published in 2010 by Harvard University Press”

# BLURB FOR TEN TALES OF SYNTHETIC BIOLOGY

iGEM projects are generally about constructing things: software, hardware, wetware, art, and even communities. To this list we can now add words. Here the objective is to expand our thinking about how our constructions will play out in the world. Writers from the 2013 Valencia Biocampus team would like us to raise our eyes from the bench and the keyboard to consider just where all our efforts are headed.

The authors set out to explore both pessimistic and optimistic futures. Science fiction often manages to look only on the bright side, but *Ten Tales of Synthetic Biology* looks also in dark corners. Even the optimistic stories suggest a wariness of how new technologies – technologies that the authors themselves are inventing – will be used.

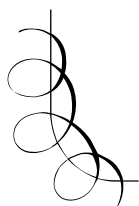
One story describes a cancer cure, arrived at only after a great cost. In another, open source biology provides energy and freedom to a world in which conditions have become so dire that only radical change can provide hope. Human nature at its worst shrugs off death of stranger and family alike to celebrate a proficiency at creating biological weapons. The message is clear: while scientists are beginning to demonstrate fairly sophisticated understanding and construction of synthetic biological systems, these stories serve to remind us that every light creates a shadow.

In reading these entertaining stories, one must keep in mind their origin. The authors display great enthusiasm for their subject with stories that, like all iGEM projects, were likely prepared during a period of intense work and insufficient rest. Occasionally the premise diverges quite substantially from the world as we understand it today. But then, of course, these stores are science fiction. Expanding one's horizons sometimes requires stretching credulity.

As Yogi Berra said “Prediction is very hard, especially about the future”, so did Alan Kay remind us that “The best way to predict the future is to invent it.” These stories are written by members of the next generation to invent the future; even where the edges are rough, we should pay attention to their predictions.

Rob Carlson

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# WILL I BE OLKAY ?

ORIGINAL IDEA *Alba Corman*

M



My name is David but everybody knows me as Dave and I am 10 years old. I am a normal kid but with a strange disease that makes me live having to be careful of absolutely everything I do. The illness I have has a weird name that only my brother and the doctor know how to say fast. Because of my disease I can go from suffering uncontrolled trembles to forgetting things that Alan has to explain to me again. Sometimes my whole body hurts and others it is hard for me to breathe. It is very unpleasant.

They discovered I was sick when I was 7 years old. While my teacher was talking, I just fainted. I woke up in the ambulance with my brother Alan on my way to the hospital. I do not remember a lot about that day, but one of the things I will never forget is the face of my older brother; he was completely pale and he seemed horrified. I have never confessed it to him but, before he noticed I had woken up, I heard him say out loud that he was afraid that it would be the same thing that took mom and dad away.

I did not before, and I still do not understand that sentence because Alan always said that our parents were on an island due to work issues that did not let them be here with us. Every time I ask him if they are coming back, he always says that they will not come back for a while. I am sure that when they come again we will be able to play in the yard like we did before I got sick.

Even though my illness makes me waste a lot of time in the hospital, I love doing a lot of other stuff. What I like the most is reading superhero comics. I discovered them during the week I had to be hospitalized to get some tests done due to my disease. To avoid getting bored Alan brought a bunch of comics from when he was little. There were a lot of Spiderman and Batman comics; however, my favorite ones were always X-Men because each of them had a different superpower that was useful and amazing.

When I grow up I want to be a superhero and help everyone who needs it in the whole world. Every time I tell Alan about my dream he says that with that idea I would be a great doctor or scientist. I do not like Alan's work nor Doctor Cronin's

because they can only help people in a determined place; I want to help the entire world at the same time. Nevertheless, people that are capable of flying or having super-speed do not exist, so I might end up being a scientist like my brother. The other day he told me about a thing called Synthetic Biology, or something like that, which in a few years might be responsible for...people with superpowers! Alan has explained to me that with this new science, investigators can actually give humans powers that only machines and other animals have.

After three days in a row in the hospital, today is a special day because Alan has told me that they I am going to try the first medical treatment based on Synthetic Biology. I'm sure I'll get some type of superpower! (Alan said that I am going to be the first person that has one).

My brother and Dr. Cronin had been discussing if they should try it or not for several days. I think she did not want to try it because it could be dangerous but Alan felt confident that it could actually work. I believe that if my brother says so, everything will turn out all right; he is the most intelligent person in the world.

A nurse has come in and started pushing my bed. She has taken me down a long corridor where I saw how thousands of white lights passed over my head. We have arrived at an operating room where my doctor had been waiting and Alan was watching through a glass wall.

I am lying down. A man that is behind me puts a mask on me while he says that I am now going to fall asleep but I have to count up to ten out loud. It is my moment to demonstrate how intelligent I am!

One...Two...Three...Four...

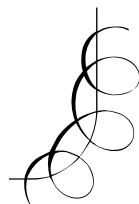
Silence.



I am concerned about my little brother. He is on the operating table because I insisted on trying the new treatment after discussing it with Doctor Cronin for several days. She has always been so traditional.

10-year-old David sees everything with different eyes; he believes everything works at a special rhythm full of magic where anyone can fly if they want to. He, having that magical vision of life, convinced me even more that he should try the new treatment. It is no life for a kid to be going to the hospital every day to get checkups to control if everything is still in safe limits, without even having the security of living till next day.

Seeing him there on the operating table makes me think about how he ended up like that and I cannot avoid remembering my parents. They both had a dominant mutation in chromosome 13 that made them suffer during their whole life making them get checkups and have doubts about their future. They always talked about how they had met when one of them was entering the doctor's office while the other one was leaving. The same disease that separated them from us was the one that joined them.





The Burroughs-King Syndrome affects a small number of people in the world but destiny ended up connecting two people that suffered from it and they fell in love. They decided to have two kids, Alan and Dave. Because they were heterozygous, there was a 25% of possibility that they would have a healthy kid. They were lucky with me, but David did not have the same luck; he had even worst luck than our parents because he received two defective copies that worsen the disease.

The disease is characterized by a multiorgan failure produced by the death of all type of cells, from neurons to epithelial. This is the reason why the symptoms can be similar to any degenerative disease, such as Parkinson or osteoporosis... any of them in any combination.

Both of my parents died the same year due to their disease. They had enough time to have children and enjoy them as much as possible. Hopefully, Dave could have the same luck but it was not likely; his condition at ten is the same as our parents when they were 35. That is, I doubt he has more than five or six years left.

I graduated in Health Biosciences to try and help my brother and my investigation group started their research about his disease. The idea was simple: create synthetic human cells capable of creating all types of compounds to avoid cellular death. Something like a miniature cellular doctor that when it detected that one of its patients was about to die, it would do anything it could to save his life.

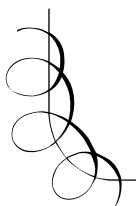
During our research we found numerous problems, for example, if the cellular doctor's mechanism lost its control, the animal on which we were experimenting would develop a powerful tumor that ended up killing the animal.

But not even a year ago, we achieved our first positive results and today is the day in which we are going to try them on a human subject... my brother.

It has taken me several days to explain the complete surgical process and how it could actually work to cure Dave's disease to Doctor Evelyn Cronin. She ended up being a very close-minded person, more than I expected. She accused me of millions of things, including the fact that I only wanted to experiment with my brother to obtain recognition and money after developing an effective treatment against degenerative diseases.

I explained to her that to treat that disease we had to set several cellular doctors in different parts of his body so that they could supply all the cellular deficiencies that caused death. The ones that had to be installed in the lower body parts would not cause any problems in theory; however the problematic ones would be the ones that had to be installed in the boy's brain. That was the reason why we needed the help of a well-trained surgeon. Doctor Cronin is afraid that the body understands these new cells as an external hazard and that it starts to develop an immune response. This reaction would cause inflammation and it would damage Dave's brain. I am certain that this will not happen; I designed the cellular doctors from cells that came from Dave's body. It has to work.

The doctor finally accepted being part of the project with only one condition that I accepted without a doubt: if it did not work, she would be the one in charge of putting me



behind bars for irregularities in my research. There had never been any and she knew it. I know she made me promise this so she was sure that I was confident with my work, that I knew it was possible and that my motivation was sincere.

Dave was the easiest to convince about being subject of that surgery. I promised him that he would end up with superpowers like all the characters from the comics he loved. And the poor child did not doubt it; not even for a second. I thank his trust in me because it makes things much easier. It is like the fact that he still thinks that our parents are working abroad; it is better he believes this for the moment.

I am watching him there, so harmless and innocent on that stretcher. All the nurses, anesthesiologists and doctors around him are working to have everything ready. Doctor Cronin, despite the fact that she is the one with less hope, knows that if she does not at least try, Dave's life will only decline towards more unbearable pain and his death without even have lived 16 years.

The doctor has Dave prepared with his head held by a circular metal support while she tests the small circular saw. Once everything is prepared and the anesthesia is checked, she takes the metal instrument and starts the operation.

I really hope everything turns out fine... I want my brother to be able to pursue all his dreams.



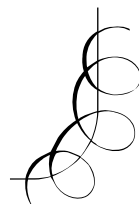
Less than ten minutes are left for me to be with my little Dave. His brother Alan has a brilliant mind, very creative and full of wonderful ideas, but I still do not completely trust his ridiculous plan of introducing modified cells in the boy's body. I still do not know what I was thinking about when I accepted this surgery.

An illness like poor Dave has is one of the strangest things I have ever seen in the years I have been in this career. In the treatment prepared, there are innumerable variables and possibilities that everything ends up being a disaster. However, I have to say that if we just overcome a couple of rough patches, it could be considered an absolute success.

I cannot stop thinking about the revolution this could mean. Cells that would be created on purpose to heal a body from the inside, being capable of regulating everything on just about all kinds of diseases. I hope it works and it can be used in many more illnesses.

Alan, doctor in Synthetic Biomedicine. Before even considering his offer, I spent a couple of days studying his history. The truth is I was surprised with how faultless and excellent he was. I have to stop thinking about the scientist; all my concentration must be focused on the surgery.

All the process is recorded in my mind: while the rest of my team is in charge of installing the cellular doctors (what a stupid name Alan came up with) in the



non-critical places, I am in charge of the cerebral area. I have to install cells in five specific points.

I cannot say it is a completely crazy plan. All the tests showed that the boy had several brain spots in similar stages as patients with neurodegenerative illnesses of around 70 years old. His only hope to have a decent life depended on his brother's ideas, and on my hands.

So, there are four possible endings. The first one is that everything goes wrong and during one of the installations we lose the boy. The second one, that after taking the risk of operating on Dave, the cells do not have any effect and he ends up as if he had not undergone the treatment. A third option is that the cells' effect is different to that expected and for example he suffers from multiple tumors. And the fourth and last: success.

I see how the nurses bring him into the operating room. In contrast to what you see in adult patients, the boy is not scared. It is the very opposite; it seems as if he actually wants to be operated on.

The anesthesiologist tells David to count up to ten.

He has stopped on number four. I breathe deeply... it is my turn. I start securing the kid's head with a special instrument. I take the circular saw; I hate this instrument, it is really terrifying, I understand why they use it in horror movies. I check that it works and that the vital signs are correct.

I take the saw closer to the kid's head and I start to open his cranium so I can have access to the cerebral tissue. Everything is going as it should.

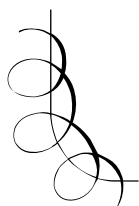
My work area is now completely accessible. I put down the saw and ask the nurse for all the necessary material to install the cells in the correct spots. Getting to the first place was not difficult and I put the first small innocuous capsule that will liberate the cellular doctors where it belongs. No problems for now.

I continue with the second spot and I manage to do it without altering any of the boy's vital signs. Everything also continues without problems with spots three and four. I start to feel that the procedure can be a success and that if the cells work, my little Dave will survive.

I make spot number five accessible and I put the capsule in its place. The small capsule loses itself under the cerebral tissue and I feel euphoric. We have done it. Or not.

The heart rate monitor goes crazy. I ask everyone to act as fast as they can while I try to find the critical point that has altered the boy's pulse. While I am trying my best, the monitor produces a constant sound and a straight green line. Completely straight; without one peak.

We try to resuscitate him with the defibrillator without any apparent success. My only and last hope is that manual CPR works.



Today was my brother's funeral. He is gone forever. I still cannot believe that I am never going to see him again, never again.

Nobody could have avoided Alan from dying. Those things are more or less common at his age. A heart attack, last night; Evelyn called me when she woke up.

In the funeral Evelyn cried for her lost husband while she buried herself in Bryan's arms, my nephew that had recently received his PhD in Synthetic Biology. Lucky Alan was able to see it; we are all very proud of him. His sister Alice was completely absent while she watched how her father's coffin descended into its hole. Alan had told me that Alice was achieving excellent grades while she studied Medicine.

When the ceremony finished I told them that now that they have lost their father and husband the only thing uncle Dave could do is be there for them for anything they needed. At the moment, tonight they will stay at my house so they feel safe and sound. My wife, Jillian, is completely comfortable with this. Alan Junior is also happy to share his room even though he is going through a rebellious phase as a teenager. My son and wife both know how important Alan was to me and I am sure they will try to help in anyway they can.

The house was already dark. Before I went to bed I wanted to make sure that Evelyn and the kids were okay in their room. I took a couple of more blankets in case it got cold.

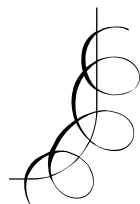
When I was giving Evelyn a blanket she told me something I would never forget... 'I am not ashamed I listened to your brother when we decided to operate on you'. I did not know what to answer.

Now I am in bed, next to Jill, just thinking. Evelyn and Alan were the two people who saved me from a certain death around 40 years ago. If it had not been for them I would have never won the battle against that rare disease that attacked me when I was a child and that took my parents away.

In all the family meals they would always talk about how I almost did not survive the operation. Thanks to Evelyn's insane effort to resuscitate me I finally made it. Alan always said that that exact moment was the one that made him fall in love with Doctor Evelyn Cronin. I still remember how in the next visits to her office they would get closer little by little.

That period of time made my brother earn fame in the scientific world; diseases were never going to be the same thanks to his effort. The treatment with cellular doctors, which started with me, just kept on expanding and improving in different fields until it was effective against almost any illness. The best way to celebrate these achievements was with the engagement between Evelyn and Alan; it was great that the doctor became part of our family, even though she had already been acting like a family member since long before.

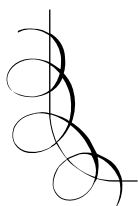
When I was a bit older I finally realized the risk they had both taken trying to give me a better life...and the best way to return his favor was doing what Alan



always told me to do: I became a scientist to try and help other people. A scientist like him.

I can feel how tears are rolling down my cheeks again. I am going to miss him so much. Alan was not only the best brother anyone could have; he was also the parents I had lost, the person who saved my life and the most important thing, he was the person who guided me to what I am today.

Alan always joked about the fact that I wanted to be a superhero when I was young. The day I got my PhD in Biosynthetic Sciences applied to health, he just said: ‘You finally achieved your dreams; now you don’t have anything to envy from any of the people in your comic books!’



# KEPLER-62f

## ORIGINAL IDEA *Jessica de Loma*

Lizzie was doing an analysis of pasta. She worked at The Smiling Granny doing microbiological controls on frozen food that the company manufactured. She had to make sure that all of the sets were clean without any sign of strange microorganisms that could give the company a bad name; a frozen foods company with more than 65 years of success. It all began with Edgar Mumford, owner of a small chain of grocery stores in the county of Cumberland. When freezers started to become popular, Edgar saw the opportunity to distribute frozen food.

That is how Mumford Frozen Foods was created, and soon due to its success, was bought by a famous multinational company that did not take long to change its name to something more family like.

Edgar's story of progression and success was just the opposite of the young analyst's. Lizzie, in reality, was Isabel. She was born in Spain and when she was



a small girl she loved things like microscopes and bacteria. Her dream had always been to dedicate her life to investigation and that is why she studied to become a biologist. But when she finished her degree, the country's economic situation did not have anything to offer. She looked for months only to finally realize that she was not capable of finding anything in her country of origin. Her final decision was to move to a different one.

She chose the United States for everything it represented: it had an excellent scientific panorama, as well as a very interesting culture and customs. This decision did not work out either. Upon arrival to the new continent the only job she found was as a food quality control analyst at The Smiling Granny in the Boston branch. She accepted the job since she needed money to survive until she found something better, and she was still there three years later. The only thing she was getting out of the experience was that she was learning the language and had a new nickname. Her co-workers called her "Lizzie" and she liked that.

Once again it was time to get off work. The days passed by endlessly without any sense due to the fact that they did not offer anything new or any type of challenge. The truth was that Lizzie felt extremely bitter towards a lot of the aspects of the scientific world. In her opinion, a lot of experiments that were performed had no relevance for ordinary people. She had the sensation that many scientists did not prioritize correctly the important aspects of an investigation. They let themselves be influenced by selfish things such as money, becoming well-known or simply found themselves guided by lines of investigation that were interesting to them but not to society. That was what Lizzie wanted: to offer the world a service.

When she arrived to her apartment, her roommate appeared just as she opened the door. Laurie was a student at Boston University. Her life was great; she was very



lucky indeed. She worked in a very prestigious microbiology laboratory thanks to her father, a very rich man that worked in the construction business, who subsidized the line of investigation where his daughter wanted to collaborate. Specifically, under the supervision of the brilliant microbiologist: Richard Blake. In spite of all of this, Lizzie learned to value Laurie.

– Lizzie, you have to see this! – Laurie seemed surprised. Laurie guided her friend into the living room where the large television, a gift from Laurie's dad, was showing some very strange scenes. The scenes were of the migration of thousands of birds in different parts of the planet and of herds of large groups of animals on the African continent. They seemed to be fleeing from something.

Lizzie remained skeptical and tried to look for biological reasons such as the high temperatures that year. Laurie, on the other hand, quickly began to talk about conspiracy and H.A.A.R.P. project experiments for the mental control of living beings in groups. She was a fan of governmental secrets and she showed it openly. Lizzie was tired and did not feel like staying up talking about something that would probably have an explanation tomorrow. She got up off the sofa, said good night to Laurie and went to bed.

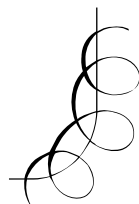


She got up early as she did every morning in order to start work. She needed to leave early that day since it was a special. Lizzie's parents were arriving from Spain to visit her. After working for many years, her father had retired and now he had time to visit his daughter for the first time. Their flight should have left Madrid the day before and the girl would pick them up that same afternoon from Logan International Airport in Boston.

The day started out as always except for the fact that Adrian, one of the microbiology analysis managers, had not shown up for work. The strange thing was that he had not called in sick and he did not answer his telephone when they called him from the office. Lizzie liked Adrian. They had been together once but he was a distant guy and not very romantic who kept his distance due to previous bad relationships. He had always studied to become a microbiologist, but his career had been interrupted when he became an orphan. He had to quit studying and find work quickly in order to raise his younger brother and dedicate his life to taking care of him. Maybe Lizzie would stop by Adrian's house on the way to the airport to see if everything was okay.

When her shift was over, Lizzie got into her small, second-hand car and headed for the airport. She had to go out of her way a little to get to Adrian's house but she did not doubt one second. She wanted to see if Adrian or his brother needed something. She parked on the street where Adrian's apartment was. She knew where he lived due to the fact that one Christmas after the company dinner party and a lot of alcohol they ended up spending the night together in his apartment. This had been the first and only "sentimental" relationship that Lizzie had in the three years she had been in Boston. Just as it had started, it flew away. In spite of the bittersweet sensation that this had left in Lizzie's heart, she was able to let it go and suppose that the only relationship her co-worker needed was taking care of his brother.

She rang three times and received no answer. Then, she rang the neighbor's bell. The neighbor opened the door and they both went up to Adrian's floor. There, the neighbor, who was also his landlord, was complaining that he had not been able to





contact him to collect the rent that was due that day. Lizzie knocked on the door. No one answered. The grumpy landlord looked for a key in his pocket and opened the door. They entered the dark apartment. There was a certain sweet, but unpleasant odor in the air. – Adrian? It's Lizzie. I've come to see if you need anything. – There was no answer. –Is everything okay?

Then she saw them; the two bodies. Adrian had his work bag hanging from his shoulder and his brother had his backpack for school. They were on the floor with their eyes rolled back, purple skin and swollen extremities. Lizzie ran over to them to check their state. She started to cry when she realized that they were dead. There was no sign of violence on their bodies. It was as if they had both collapsed at the same time as they were getting ready to leave the apartment. While Lizzie continued in shock, the landlord took his cell phone and called the police.

The police arrived quickly and questioned Lizzie and the landlord. Lizzie asked a young police officer to please call her and let her know what had happened as soon as they had any information. She got out of that apartment as fast as she could and headed for the airport. She could not get the image of their bodies out of her head. She wondered what could have caused the death of two people at the same time and produce such a strange aspect in the dead bodies.

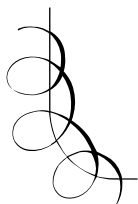
When Lizzie got to the airport, she still had an hour to wait for her parents' flight to arrive. She went to the cafeteria and ordered something to eat hoping to be able to get the image of the dead bodies out of her head. As Lizzie had her sandwich and orange juice, she watched television. There was a typical police series on where the officers break into a house dramatically and save a hostage. She could not hear too much due to all of the background noise in the cafeteria. Even still, she could see that the series had been interrupted suddenly to give a news flash. It appeared that dead bodies were being found in different parts of the world. All of the bodies were swollen, purple and with their eyes rolled backed. The news reporters described it as a pandemic. From what Lizzie heard on the news, the best investigators were already working to discover the cause.



Lizzie was in the waiting area. She was frightened about the news she had just seen. While she waited behind the huge glass window, she received a message. It was from her mother saying that the flight had been canceled due to the pilot's death minutes before the plane was about to take off. They had been retained on the plane for ten hours until the cause of death had been declared as unknown and afterwards they were allowed to get off the plane and use their telephones. The message said that it would take the airline company a couple of days to arrange new flight dates. She would have to wait a bit longer to see her parents.

After reading the message, Lizzie was watching the runway trying to think of what to write to her parents. Lizzie wished she had not been looking in that direction. Flight 815 flying in from some Pacific Ocean was getting ready to land when the left engine went into flames and blew up. The explosion caused the loss of the wing and the pilot lost control of the plane. The plane was heading for the runway too quickly and the passengers aboard knew their destiny.

The girl watched in shock as the plane touched down in an almost vertical position creating a huge ball of fire. Thousands of eyes watched from behind the



terminal windows. People started wondering about the cause of the accident. They debated if it had been due to a human or technical error, a bird in the turbine or a terrorist attack. All of the theories fell to pieces when another airplane crashed as the first one had. And then another one. And three more. It was a nightmare. This could not be happening, Lizzie thought.



It took her seven days to begin to come out of the black hole in which she found herself trapped. Lizzie had cried all of the time that she had been awake. She was happy that her parents had not flown in, but she still was not capable of comprehending what she had seen. During the past few days the world seemed to be going even crazier.



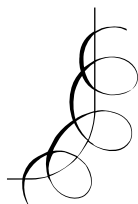
All parts of the world turned into a dangerous place where it could rain fire. The day of the accident, the same thing happened in practically all of the airports in the world and there were also cases of airplanes falling directly from the sky into cities. After that, all air and maritime transportation was canceled for precaution. Soon after, public transportation, like the subway, was also stopped due to three accidents following the same pattern as those of the airplanes. The experts could not find an answer for the repeated incidents. They could only be understood as terrorist attacks, but no particular country or region had been targeted.

Complaints against electrical appliances that did not work correctly began to go through the roof. Shopping centers and specialized stores had thousands of returned products since the buyers were not even able to turn them on. Cell phones, mp3 players, and other audio devices lost their sound leaving only a background noise that sounded like a radio that was not tuned in completely.

People continued to show up dead in their homes or they fell to the ground while they were shopping, walking or doing sports and did not get up again. Always with the same characteristics. Lizzie followed closely the advancements of the topic. The most prestigious investigators and doctors of the planet observed that every cadaver had the same thing in common: a complete paralyzation of the circulatory system and enlargement of the blood vessels causing swelling. Besides that, the brain tissue appeared to be completely unstructured.

But the strangest thing happened on the seventh day. The entire world went dark for half an hour. All electrical appliances stopped working. There were countries that went through it during the day and they felt a general blackout. In the countries where it took place during the night, thousands of people could see how greenish lights floated over the main cities with flashing movements. The best engineers in the world assured that there were not any man-made machines capable of carrying out those kinds of movements in the air. The lights were also undetected by any type of radar or state-of-the-art military detector.

Lizzie was finally able to clear her mind a bit after hearing the latest news. She sat at her computer and looked for information. On the internet there were people who believed in the Drake equation, affirming that they must be UFO's and gave a lot of arguments in favor. Besides that, other people on the web were saying that they



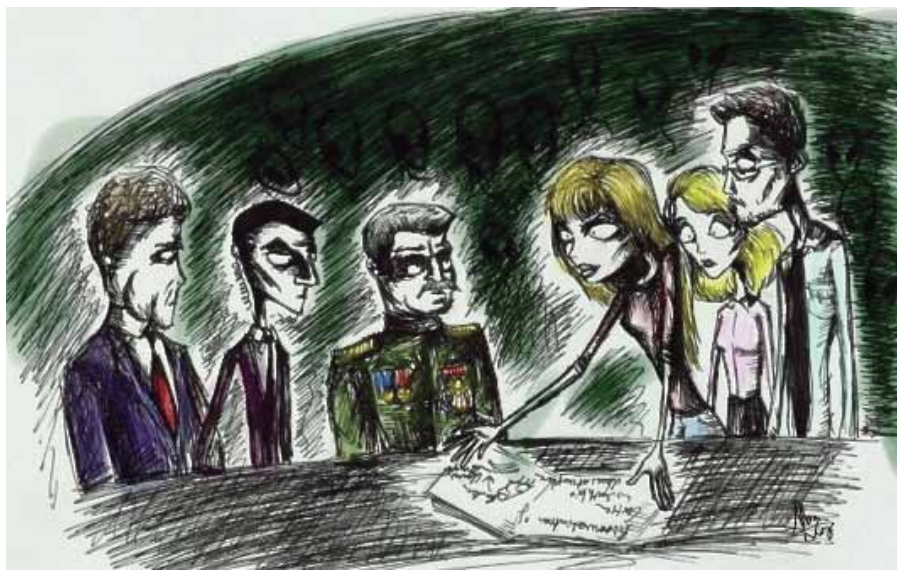
had been abducted and subjected to different experiments. The conclusion was that the line that separated what was real from the X files was very fine. What practically 100% of the population agreed upon was that we were not alone in the universe. It was a historical event and she was living it. Lizzie was very ambitious when it came to knowledge. She needed to know everything possible about the topic. She read about the SETI projects and about how they had not obtained any definite results. She learned all about the famous cases such as the Shag Harbour incident and also about the Fermi paradox. She was passionate about the topic, maybe because it was helping her get through everything that had happened that week.

While she was surfing the web, she started thinking about something: the extraterrestrials had appeared in the same period of time in which the Earth had started to fall to pieces. It could not be a coincidence that the aliens had appeared at the same that people were dying, electrical appliances quit working, transportation was failing and animals were migrating in unknown ways. The people who truly believed in the presence of intelligent life on other planets thought that their objective was aggressive and colonizing.

She finally turned off the computer. The girl was letting her imagination run wild with a bunch of crazy ideas from the internet. She needed to stay focused. There was no real proof that extraterrestrials existed and that they had anything to do with what was happening. She went to bed to get some rest and to try and get the bad memories out of her mind.



Lizzie woke up at midnight. She had had a terrible nightmare. She was having a lot lately. She went to the fridge for a glass of milk. She picked up the remote control and turned on the small television that was in the kitchen to see if there was any updated news. She was about to take a drink of milk when it happened again.



All of the electrical appliances in the world went off leaving the world completely dark. The green lights appeared again, but this time there were more. But it did not end just there. All of the screens on Earth started to emit a message of white letters on the black backgrounds. Clicking and the sound of metal hitting metal could be heard. The following could be read on all movie theater screens and on all computer, telephone and multimedia devices:

*Hello, inhabitants of the Earth,*

*We have been witnesses of your evolution and how you have evolved into the dominant species on Earth. Now we know you better than you know yourselves.*

*We are beings composed of carbon and we need to live in a planet with the same composition as yours, almost exactly like yours. Our planet of origin is Cartia, which you know as Kepler-62f. It is contaminated and almost completely destroyed because we have not taken care of it. The atmosphere has become toxic due to an excess of carbon monoxide and our inhabitants are being poisoned and dying. We only have little time left before our planet collapses, but you learn from your errors and the same thing will not happen again. Now we need a new place to begin from scratch and Earth is the ideal planet.*

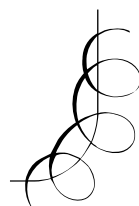
*We are sorry to inform that you do not fit in our future plans. The destruction taking place these days is part of the plan of clearing you from the planet. You probably wonder why we cannot all live together and the answer is that our population alone requires all of the resources for survival. The Earth is smaller than Cartia and we will need the space you occupy and the resources that you are running dry. Besides, we suspect that you are not willing to share.*

*Do not waste your last moments trying to fight us. The weapon we have designed to destroy you is working as planned. We are familiar with every machine made by man and have designed mechanisms against all of them, for example the one against your airplanes which works perfectly as you can see. Little by little you will disappear.*

*Enjoy your last days on Earth.*

The glass of milk crashed to the floor. Lizzie stood there with her mouth hanging open until the lights came back on. Laurie came into the kitchen with sleepy eyes. The noise of the breaking glass had woken her up. First she asked what had happened, but an answer was not necessary because the television was already giving a special report. The conclusions that the newscast had come up with were depressing. Some experts were looking for a solution, but a lot of them had already decided to give up because they did not know when their loved ones could be victims of an attack.

The two girls talked about the extraterrestrials until the Sun started shining in their apartment. They discussed various aspects but both agreed on the same thing. First, there was not any possible justification that would give the aliens the right to eliminate the Earth's population. Second, they would not just sit there and wait for it to happen. They were going to look for a solution. They both analyzed the message from the Cartians. It was selfish and showed no empathy toward the human race. The extraterrestrials had turned their planet into an inhabitable place to live and now they wanted to go to another one as if a planet could be used and tossed out. During the analysis they looked for information that would allow them to deal with the threat that they had before them.



Lizzie was the one who realized the two most important points of the message: An uninhabited, contaminated world and that the extraterrestrials stated that they knew every imaginable microorganism. With these two points, the young food analyst, after a couple of days, came up with a possible solution. Now she needed to discover how to put it in to practice.



The governments of all the countries agreed to cooperate with the objective of creating a “Committee of Extraterrestrial Threats”, the C.E.T. This way they would be capable of making decisions in the shortest possible amount of time and always under international consensus. A group of specialists in every field, military minds and politicians formed the C.E.T. The meeting place, due to its technical resources, was the Massachusetts Institute of Technology, known as MIT, in Boston. More specifically, it took place in an underground construction located under the Charles River. This was one of the security measures taken in order to assure that the Cartians would not have any knowledge of the decisions being made.

Among the microbiologists in the group was Dr. Richard Blake. His mind worked at high speed, thinking about how they could fight the Cartian beings. He spent various hours a day in the armored lab under the river provided by MIT. There he discussed different ideas with scientists of all fields with little hope of a solution. The military experts and engineers looked for a way to attack the Cartians with some type of missile or high frequency wave, without even considering how they would be able to find them. The political scientists wanted to strike up peace talks, while the leading bioscientists wanted to study every detail of the biological characteristics of this new alien species. Not one solution was feasible since everyone knew that the Cartians were always one step ahead and would always be ready.

Since Blake was not coming up with any positive results in the secret base, he worked in his private lab in downtown Boston. The biggest inconvenience was that since his investigation was confidential, his students could not work with him and that made his test results slow. During one of his experiments someone knocked at the door and he hurried to ask who it was.

– Hello, Dr. Blake. It’s me, Laurie. – She was one of his employees. A young, intelligent, hard-working girl, who also had a rich father who financed many of his requests. –I’m here with my roommate, Lizzie. She thinks she has found the solution.

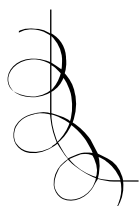
Upon hearing this, Blake immediately opened the heavy glass door to find his student and a girl a few years older than Laurie. What surprised him the most was the look of determination that he could see in her eyes.

–Hello, Doctor. It’s nice to meet you.

Lizzie started to tell the doctor about her project. He thought that the idea was great and they quickly got to work to see if they could achieve the results they were after. They worked against the clock since any one of them could be a victim at any time. But they were lucky and after four days of continuous work, they got it.



Richard Blake drove Lizzie and Laurie to MIT. They were going to show their results to the C.E.T. and the two young girls deserved to be present. He entered the



main building and walked towards the underground base where he had to access a special elevator by the means of an eye scanner and an alphanumeric code. Once below, they took a jeep through a long, dark tunnel until they got to the base. The two friends rode along surprised and a bit frightened even though Dr. Blake had warned them that what they were going to see was worthy of a science fiction movie. But to tell the truth, if extraterrestrials did exist, the secret base completed the recipe.

They arrived at the base and asked to quickly organize an international meeting. The meetings took place in a semicircular room where all the members could see one another and there was a large screen on the side where the presidents of the leading countries appeared via teleconference. In five minutes each one was in his place. Lizzie noticed that a few places were empty and Blake commented that it was due to the fact that they had been victims of the Cartian attacks. After that, he began his speech.

—Good afternoon, my dear colleagues. I bring you the solution, from the hand of this young lady, Lizzie. —The sentence was so direct that it caused commotion in the room. —Her idea is simple: bioremediation. This young lady has thought that through Synthetic Biology we could create a bacterium that would clean the atmosphere of Cartia so that the extraterrestrials wouldn't have to "steal" our place. They would simply have to clean theirs.

Everybody in the room was astonished. It was a great idea that could actually work. It prevented war and conflict and they were giving the Cartians a solution.

Lizzie started to talk. She had a briefcase where she was carrying the new bacteria that they had modified a few days before.

—We have been working hard and in the end we have a stable and efficient cell line. —With this sentence Lizzie got rid of all of her nervousness. —It's a bacterium capable of eliminating carbon dioxide and other toxic gases from the atmosphere and afterwards it is capable of liberating oxygen in order to adjust the concentration to maintain vital levels. The only thing the Cartians would have to do is spread this bacteria in their seas for it to begin to grow and expand while it purified the planet.

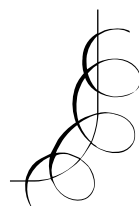
—How could that work? —asked one of the scientists. —What if the exact conditions of their planet are not the ones we are imagining?

—In Synthetic Biology there is something that exists that we know as 'biological standard pieces. These allow the modified organisms to adapt to pH conditions, temperature and pressure in a wide range. —Lizzie hoped she had sounded convincing.

The experts looked at it with certain skepticism in spite of the fact that it had been the best solution suggested up to the moment. Hope started to fill their hearts once again and little by little people started to imagine they could actually achieve it. They only had to get the bacteria to the Cartians and everything would go back to normal. Before that, they decided that they would perform higher scale experiments during a couple of days to make sure they had possibilities with the young woman's bacterium.

Everyone agreed that Blake and Lizzie were the best choice to deliver the bacteria to the Cartians. The delivery plan was based on leaving a message on all of the pages on the internet and broadcasting on television and radio during 72 hours with the hope that the Cartians would read or hear it on one of their information controls.

*"Cartians, we know how to recuperate your planet. We have created a synthetic*



*bacterium that, through bioremediation, is capable of reestablishing the balance of Cartia simply by cultivating it in your seas. You can pick it up tonight at midnight in Killian Court in front of the Maclaurin building in MIT in Boston.”*



When there were only 30 minutes left till midnight, thousands of people gathered around the MIT waiting for the Cartians to pick up their salvation and leave them alone forever. Television reporters from all over the world were there to cover the news. People were everywhere except where the pick-up point had been arranged. Only Blake and Lizzie, with a briefcase in her hand, were situated in this point. Inside the briefcase was a bacteria culture in high concentrations, a manual for its use and a replication protocol in case they needed to modify the bacteria again.

At midnight the lights on the planet turned off again. But this time, only one green light appeared in the sky. It was over Boston, in front of one of its most emblematic buildings of the MIT. Blake and Lizzie felt like they were in the center of the universe at that moment. They were watching the light over their heads when a beam of light shined upon them. It was so bright that they could not see anything at all. And there, the Cartians spoke directly inside the heads of Blake and Lizzie:

*—We have received your message. We will take your bacteria. We will try and make it work. —* The voice had a certain virtual tone. It must have been passed through an electronic translator. *—If it works, you will never hear from us again. But if it does not, we will continue with our plan to clear your planet.*

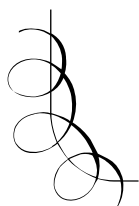
When the green light disappeared and the lights of the Institute came back on, the briefcase was no longer in Lizzie’s hand.



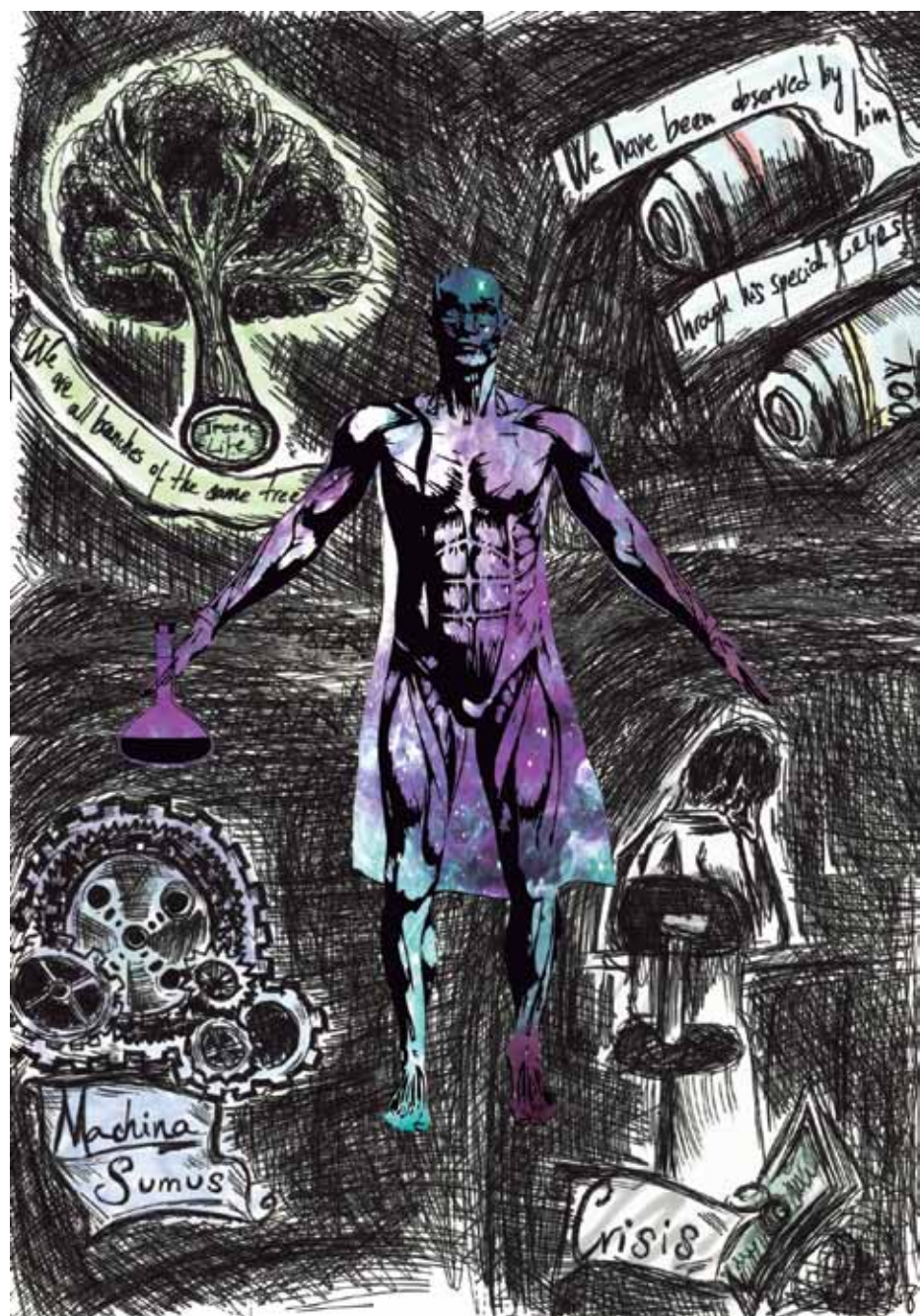
A year after the “Cartian incident”, the planet had changed radically. The world began to value its existence in a different way. We were no longer the kings of the Universe. Science grew as the new pillar of society, considered to be a tool to assure the well-being of people. Synthetic Biology had just taken off, turning into one of the main scientific branches with the laboratory of the doctors Richard and Lizzie Blake at the head of Biosynthetic studies. For example, the same bacterium created to solve the Cartian incident was about to be used on the planet Earth with the same intention of eliminating part of the damage caused by the Greenhouse effect. Nobody forgot that a conflict at a galactic scale had been resolved with the simple idea of modifying an already-known organism.

As Lizzie left work that day, happy she had the job she had always dreamed of, she remembered she had to make an appointment for her next echo. This one was special because her friend, Laurie, was going to accompany her. While she was looking for the doctor’s telephone number, the screen went black and a brief message appeared that made Dr. Lizzie Blake smile:

*“It worked. You not only returned hope, but also life. Thank you.”*





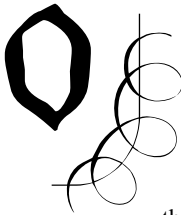




# CHRONICLES OF OUR ORIGINAL IDEA

*Samuel Miravet*

# EXISTENCE



ur story goes back millions of years ago, to a time the historians know as ‘The Dark Millennium’. During this period He had still not appeared in our lives to bring salvation, so the world was very different to what we know nowadays. In that inhospitable setting of death and destruction, we appeared by a quirk of fate.

During ‘The Dark Millennium’ our ancestors had to survive in a wild and violent place where the laws of evolution decimated part of the population. Anybody could be born and the next day, die without anyone even noticing our existence.

The differences between that past time and the present are innumerable. We lived in adverse conditions; sometimes we died due to extreme temperatures and other times we just froze to death. Bigger predators would devour us when our only objective was catching something to eat from the sea; we were always cold or hot and we had to look for our own food by ourselves. But nowadays, we have all gotten used to His kindness and His omnipotence to fulfill all the needs we can possibly have.

Amongst all the chaos, the law of the fittest prevailed. Our ancestors were not even capable of maintaining any type of registry from that obscure period of time. Once He appeared, He started to analyze us in detail until He was finally able to discover the first moment in which life started on our planet. He was able to go back in time and discovered our first steps in the universe. What He found out was shocking: we all have a common origin, that is, as the branches in a tree end up growing from the same trunk, we all have a common ancestor.

The ‘trunk’ was based on a chemical composition similar to ours, even though it would probably have a different genetic structure. A lot of us are collaborating with His investigations about the origin of life and every day new achievements are made in this field. Thanks to our invaluable collaboration new information is discovered, for example life could have worked with ribonucleic acids before deoxyribonucleic acids or we could even uncover which are the minimum genes required to say that an organism has life. All this matters to us because it means that we could understand part of our history and that way comprehend our identity as individuals on Earth.

Our God is not only interested in knowing our starting point, but the rest of our lives up to now also interests Him. Knowing the evolutionary progression that has

defined us how we are today is a revision of everything we have lived as a species. Studying our origins and evolution means that we can avoid future tragedies and that way we can keep on living under the protection of our God for many more years.



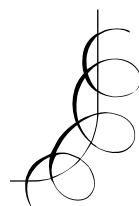
He came on the scene initiating 'The Golden Era'. Nobody knows His origin for certain but what is clear is that He meant a turning point in our existence.

The theories about how this God appeared are many and at first sight, they are all consistent. Some think that His origin is just circumstantial, this is, our ancestors lived in absolute chaos and for this reason a new figure capable of organizing us appeared out of nothing. Others think that He is just an individual like us but that has reached a different level of evolution. This means that we stayed at the same point, something that does not mean that we are not progressing, while He continued evolving at an unimaginable rate until becoming what He is nowadays.

In spite of everything, His origin is what matters less. What I am going to try to explain is the radical change his appearance supposed, but before starting I shall leave something clear: There are more superior beings (than us, not Him) that could possibly be like God but that ended up developing other labors in the world. We know they exist because we share spaces with them and many of our tasks are for them. What made Him different from the rest was his dedication and His complete service towards our necessities. Besides, you cannot understand God as an individual figure; He is everywhere so He can take care of us in a personalized way and help us all at the same time. This omniscience is just another thing He is capable of doing and that only strengthens the idea of his unlimited power.

When He appeared in our day-to-day, advantages were almost immediate. The first contact was qualified as frightening amongst my ancestors that from then on would refer to that period as 'The Kidnap'. Supposedly, He appeared and started to try and 'hunt' us and lock us up. The name full of evil that was given to this era makes sense if you consider that we were all used to surviving on our own, but we had never been locked up before. All the stories from this period narrate how He tried to find all the variety that made up our society and He stored them, with a destructive purpose as it was thought at the beginning. But it had nothing to do with this; He took care of us and started to study us one by one, separately and in a personalized way with the objective of giving us what He thought would be best for us. Like this, our new life without problems began; it was paradise.

He proved to be capable of controlling absolutely everything that surrounded us. What seemed to be at first sight some kind of exclusion in which He isolated you from all you had known before and took you to an unknown world He had created, ended up being free holidays for a lifetime. The place He had given to us had, and still has, a composition rich in everything we could ever need so



that we never lacked food. The variable temperatures stopped being a threat for our existence: if it was too hot, God would cool us; if it was cold, He increased the temperature. In the end He got to know us so well, He allowed us to live in the ideal temperature we needed so we could be as comfortable as possible. This same thing happened with all the other variables you could imagine. He could manipulate everything, absolutely everything; therefore we could always live in perfect conditions. In fact, another example of his divine power is what other companions talk about: they have discovered new populations that cannot tolerate darkness or others that have learned to live in inhospitable places (to avoid evolutionary death amongst other risks) and that also ended up under the Almighty's supervision. Because of this, He has given them all that they need so that they can carry on with an easier and less offensive life in spite of their special conditions.

In return of all those advantages we only received more. God came to understand us so well that He was capable of evolutionarily interconnecting all of us giving us a new perspective of family we never had before. In addition, we realized how worthwhile collaborating could be and thanks to our efforts to give Him all we are, we reached a new level of comprehension never achieved before and that nowadays we can find it in our history under the name of 'The Revolution'.

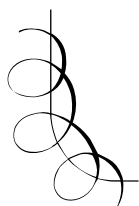


There are thousands of questions about how God got to notice us. Or He discovered us due to the 'Black' or He found us by accident.

At the same time we started living in our 'Golden Era', certain individuals born to harm our Caretaker were discovered. And nowadays they still exist: the 'Black' or the 'Murderers' of the different forms that He can have and all the other similar beings that surround Him, but are not at His level. What these individuals have against our God is the simple fact that death has to be present in our lives. It is true that in some moments He seems to forget us and part of our population is destroyed, we even suspect that He is the one who controls this destruction. But we do not see this like something negative, like some radicals against Him think; not at all. After these brief periods that resemble 'The Dark Millennium', He gives us new lands where we can keep having our children and see them grow with the food He gives to us again. It is a type of purification process.

Getting back to the 'Blacks' subject, nobody has ever been capable of knowing what the order of the discovery was: if He noticed us after the deaths some of us provoked or if after knowing us, He connected it. What there is no doubt about is His kindness: despite all the harm the 'Black' caused, He did not reject studying them and offered them a new home. With this He showed us to be kind to our enemies.

Thanks to His infinite knowledge, God managed to find a solution to the problems caused by the 'Black'. We, the good ones, gave Him the products He needed to reduce the effects of the illnesses. Basically, a product we used for our



everyday tasks ended up being the solution. He expressed His gratitude towards us directing an enormous effort of his Almightiness to taking care of the 'Producers'. These 'Producers' became the best-paid workers and had the best opportunities. Once again, God demonstrated He was grateful and thankful for everything He obtained from us.

After 'The Golden Era', the ones who remained faithful to His side and tried to collaborate as much as possible, were the most benefited during the next period: 'Machina sumus'.



We started to experience the rewards of our loyalty during the current period. It all started when myth and reality came together. First, we received news from the outside about new individuals capable of working as machines. For example, some of my colleagues assured they had been in places shared by individuals capable of emitting light or of creating strange unknown substances that God recollected to, as He said, to lengthen His existence in our world.

And it was not a myth; one day it was our turn. He came and it seemed as if He was torturing us: He took entire families and put us under extreme conditions that weakened our physiology with chemical compounds and even with electrical discharges. It was harsh and some of us never passed that transformation test.

The ones, who finally made it, were rewarded with powers never imagined. My family and I got the ability of producing new materials. But that was not it; others received the ability of talking with God through light, cleaning impossible contaminants and some were even capable of controlling the behavior of animals. He raised us to the condition of biological machines; He gave us power.

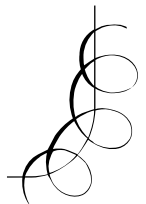
When we had power, our lives radically changed. From that moment, extraordinary became normal for us. We started working in an even more efficient way and because we were even better 'Producers', He took care of us with more interest and gave us even more rewards. It was wonderful knowing we were part of a bigger chain that balanced the universe. All of us, as a family, were God's right hand.

The ability of transforming us in machines meant that His creativity could create and convert the impossible in reality. He used us as a tool to make His dreams come true. As a result of this, our proliferation and life quality increased even more. God showed us that He had created a 'Science' where the limits between the inconceivable and reality did not exist.



During the thousands of years we have been working with Him, we have heard all His conversations. One that always seemed peculiar was when He talked about something He knew as 'Religion'. It is said that an entity superior to our God exists, that He rises to the category of Almighty Being; something like God of the Gods. We never got to understand Him. For us, bacteria, our only God is Him, 'The Scientist'.

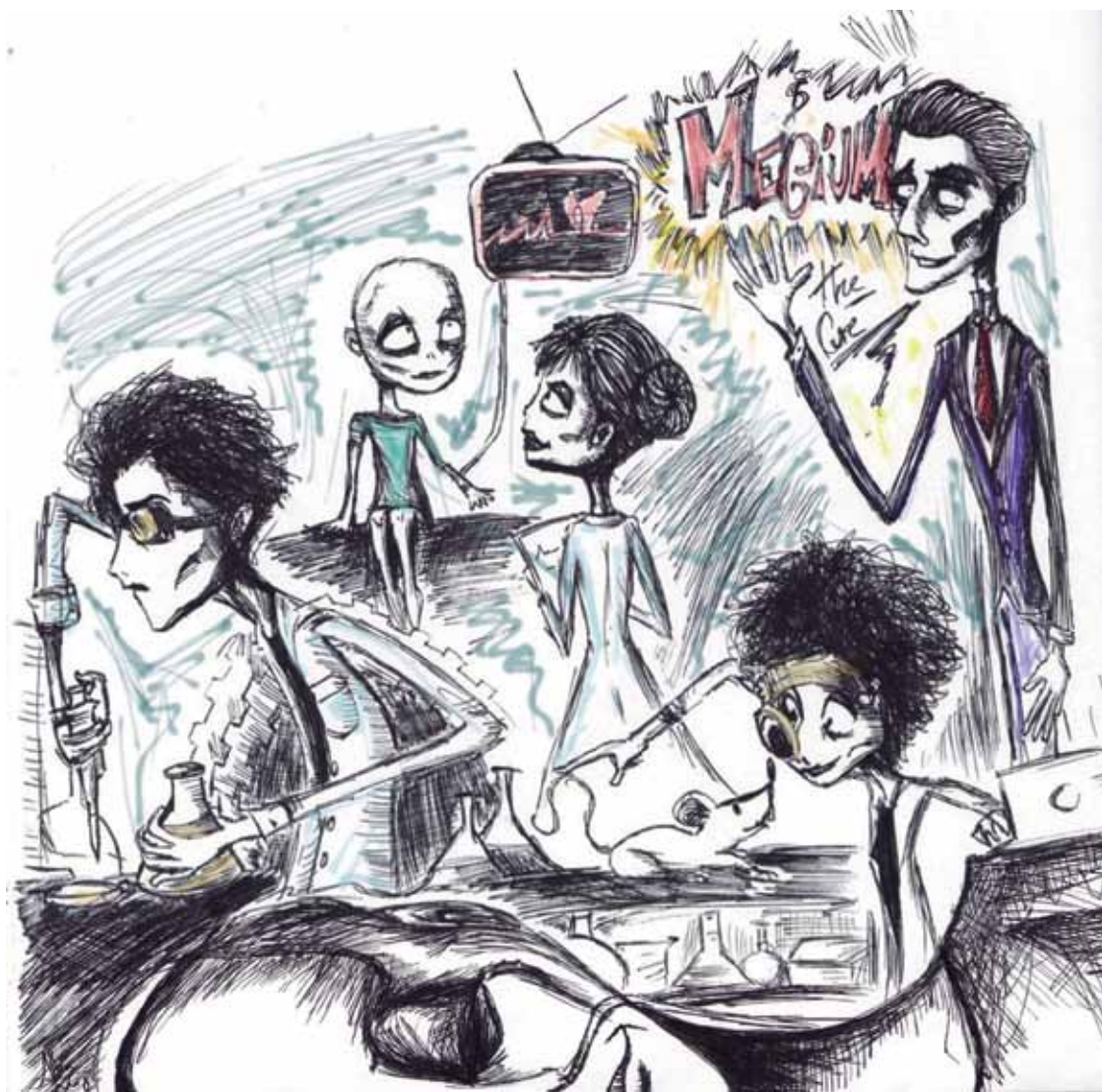
For example, now we are in a period called 'Crisis' in which it seems that God

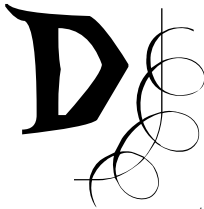


is not kind anymore. But we cannot look at it in the wrong way. It is not His fault; He is the only one who keeps on fighting for us every second of His existence. He manages to use His infinite power to get the best of us and offer better lives for the other beings that live with Him. We should all know that a great part of the well-being we enjoy and a lot of the comforts we have, have been created by Him; these are some of the reasons why we should all support Him.

Maybe, something superior created all of us at the beginning; it could be. But for us, that God of Gods is no better than 'The Scientist', because He was the one who abandoned us without any type of help in the verge of death during 'The Dark Millennium'. However, our God did help us providing us with peace, security and faith thanks to His miracles.







Doctor Mage was showing the final result to his two students: the synthetic *Megium benigna*. After ten years of hard work, Megan and Thomas were the only two people who were aware of how much effort it had taken this man to carry out this project.

– Dear students, I think we have finally done it. I would have never done it without your help.

– It's not that big of a deal! – said Megan, the less confident one of the two. – We didn't do that much.

– Don't be so humble, guys. Your help has been essential. – Mage spoke with sincerity and pride, almost like a father. – We finally have the plant that gives a fruit capable of preventing cancer and of curing it. The only thing left is trying it on humans after passing the controls on cell models and animals.

– I can see a Nobel! I hope you remember us when you are at the top of the scientific world. – Thomas was the dreamer of the team, which provided a creative mind perfect for carrying out science.

– I wish, Thomas. – The doctor took one of the pieces of fruit and started to take it to his mouth. – I have to tell you guys, that the first human subject of the test is going to be...I owe it to her.

Suddenly the doctor turned white and fell to the floor. The students were not even able to get close enough to him before falling in order to avoid it. The Megium fruit rolled along the floor away from the doctor's body.



When the paramedics arrived at the lab, it was too late. The sanitary personnel explained to the young students that their boss had died, for the moment, of unknown causes.

The students felt disconsolate while Megan hugged Thomas trying to hide her tears. They tried to imagine what could have happened to cause a healthy man to die so suddenly. Even so, the two greatest doubts that were still up in the air were: Why was he going to try the fruit himself and to what woman did he owe something?

The doctor had never been married and did not have any children. Maybe he was referring to his mother or to a good friend, thought Megan. As for the first question, there was only one answer: he had cancer. Neither one of the two students could understand why he would hide something like that.

At the end of the day the two students received the confirmation of their suppositions: Doctor Mage had died from a very aggressive cancer in an extremely advanced state and no treatment would have been effective.

Thomas and Megan felt destroyed with the revelation and the only thing that made sense at the moment was going to bed to wait and see if they felt a little better tomorrow.

– What are you going to do tomorrow? Are you going to the lab? – asked Megan.

– Of course. We have to finish the investigation.

– Okay. – The young woman's face was a combination of pain and exhaustion.

– Do you know what? Mage was the dad I never had...I don't know what I'm going to do without him.

– I'll help you with whatever you need. – assured Thomas. – You lost a father... but not a friend who loved you as if he were your brother.

The young man walked his classmate to her house. Neither one dared to say anything during this silent walk home. When they arrived at Megan's house, they said goodbye with a hug, both of them holding back their tears. Before all the pain came flooding back again, Thomas let go and started walking down the street to look for his car.



The next morning Megan and Thomas met in the lab ready to start the experimental phase on humans. They had a lot of work ahead of them: they had to find willing subjects, both sick and control groups. It would probably still take them about a year.

– Thomas, can I ask you something?

– Of course. What is it?

– Don't you get the sensation that everything we thought we knew about Mage just disappeared over night?

– Yeah, I thought about it last night before I went to sleep. The person that I thought I knew suddenly became a stranger to me.

– I don't feel comfortable working on something that has to do with a stranger.

– It was difficult for Megan to say these words. – I think before we continue we should find out who Doctor Mage really was.

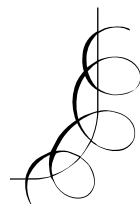
Thomas and Megan agreed that they would not feel good about themselves until they resolved the mystery about their boss. Maybe it was just an excuse to get their minds off of their boss' death and take the time they needed to get the strength to continue with the investigation. If this were the case, at least they would solve some unanswered questions.

They made a plan in which they decided the first step would be to try and talk to some of the doctor's friends and this way see if they obtained some useful information.

Megan began looking for information on the social networks and the Internet about people who were associated with the doctor. It was surprising to discover that he did not have photographs with anyone, that he did not have any added friends, or that he did not share any hobbies other than work.

When she explained this to Thomas, he thought that the best thing to do would be to go to the doctor's house and see if some neighbor had heard or seen anything interesting.

To find out where he lived, they had to ask the secretary in the investigation institute where the laboratory was. When they had the information, they decided to go that same morning.





Thomas parked his car in front of the building where Mage had lived. Before they got out of the car, he decided to ask Megan:

– Are you sure you want to do this? Once we start, there’s no turning back... we’ll have to get to the bottom of the matter and maybe we won’t like what we discover.

Megan answered with a simple nod of her head. You could see the curiosity in her eyes but at the same time you could see the fear of the unknown. After that crucial moment in which they decided to go ahead, they got out of the car and went to the building’s main entrance.

First they rang the doctor’s doorbell, and as expected, no one answered. Then they rang Mrs. Genovese’s doorbell, and this time they were lucky.

When they said they were there on the doctor’s behalf the woman did not hesitate for a moment to open the door. As they went up in the elevator to the eighth floor, Thomas and Megan felt slightly excited about what they could discover. They did not even have to open the elevator door. Mrs. Genovese was waiting there to do it for them. She invited them into her apartment for coffee and cake.

– Hello, youngsters. I’m Catherine although people call me Kitty in spite of my age. –she said, laughing. She was a woman close to 70 years of age, but nevertheless extremely jovial. The students liked her immediately. – I’ve seen on the news that the doctor has passed away due to cancer in a terminal phase. I’m so sorry. Were you students of his?

– Yes. I’m Megan and this is my classmate, Thomas. We both worked in the lab with the doctor. – Kitty looked at them with the affectionate look of a mother, or rather that of a grandmother. – We have come to ask you some questions about Mage.

– Of course. I’ll answer everything possible.

– We’re looking for someone close to the doctor, someone who can tell us if he was married or if he had any close family. – explained Thomas.

Kitty explained that Mage moved into the building nearly ten years ago and what she found out back then was that he was working in a laboratory in a neighboring city. From the beginning, the doctor was hardly ever at home and had a strange schedule, sometimes not even coming home to sleep. From what the doctor had told her, he stayed up all night long working in the laboratory. He never took women home and he never received visits.

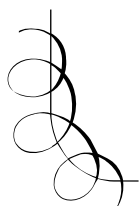
The students appreciated the information that Mrs. Genovese had given them and they also appreciated silently how curious a bored woman could come to be.

They said goodbye to the woman and left. They both knew what the next step would be: go and talk with the doctor’s coworkers. Maybe they would find out what had made him change cities ten years ago.



After spending the morning with Mrs. Genovese, Thomas and Megan decided that in the afternoon they would drive over to Mage’s old workplace. They had to drive almost two hours in exchange for a possible answer.

They started the journey and after an hour they stopped to have something to eat in a highway restaurant. Thomas ordered a huge hamburger and finished it with a



great appetite while Megan pushed around a few pieces of lettuce on her plate from her salad; she still had not recovered from Mage's death.

– You should eat a little more, Megan...we need energy.

– I know...but I still can't figure out why Mage would hide his illness from us. Didn't he trust us enough?

– Don't think like that, Meg...he probably just didn't want to worry us.

The explanation did not seem to convince the young woman, although she ate some more salad, making Thomas feel better.

They got to the modern investigation building early in the afternoon. At the reception desk they were indicated how to get to the secretary's office. Once they got to the office, they knocked on the door and asked if somebody that had shared a position with Dr. Mage was still working there. And yes, there was: Dr. Walter.

– Hello, Dr. Walter: I'm Thomas, a student of the recently deceased Dr. Mage. This is Megan, my classmate.

– Mage has died? – The doctor's face turned dark and sad. – I had no idea...

– We are very sorry. – assured Megan. – Were you very close to him?

– Yes... well, I was, ten years ago. I was the first graduate student that the doctor had. We worked together on bacteria capable of treating cancer. We obtained positive results with animals. – Thomas and Megan were surprised to learn that there had been something positive before *Megium benigna*, but they did not understand why the results had not been published. – He was a wonderful investigator.

– Why wasn't the investigation ever made public? – asked Megan.

– When we started testing on humans it was a disaster. The volunteers showed no improvement and some of them ended up dying anyway. Mage couldn't get over the failure and one day he just packed up and went to a different laboratory with less salary and privileges. Nobody understood why.

They finished their conversation with a polite goodbye and the idea that something must have happened to cause the doctor to leave so suddenly. The last piece of information they got was the doctor's address in that city. They would go immediately to see if they could discover anything else.

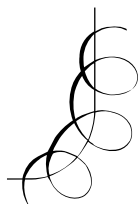


Megan and Thomas got to the address of where the doctor had lived previously. It was a small, two-story construction similar to those around it. The difference was the yard. While the neighbors had nice green grass and flowers of various colors, the doctor's yard was a jungle of weeds where the predominant colors were brown and grey.

They tried to contact the neighbors without any luck and the two of them decided upon a drastic, but useful solution: they were going to climb over the fence.

Thomas helped his classmate jump over the fence and then he jumped over as well but with certain difficulty due to the fact that he wasn't as athletic as he was a few years back.

Once they were on the property, they went towards the door and as they expected, it was locked. It was Thomas who thought of going in through the back door and there they were lucky. It was open.



The house was decorated in a classical yet timeless style. The walls were covered with landscape and still life paintings that gave an even more traditional appearance to the rooms.

There was not anything of great value apart from the paintings (and they would not be worth a lot, thought Megan). Thomas decided to split up in order to check out the house more quickly. While Megan inspected downstairs, he investigated upstairs.

Megan finished her part of the house without any luck, which was not Thomas' case. They got back together in the foyer and he showed her the new clue: a photograph in a gold frame of the doctor with a woman, a very beautiful woman.

Megan turned the photograph around over and over again looking for a name. She did not find anything. Her last hope was to take the photograph out of the frame and there it was. The photograph was signed on the back with two names: Mage and Tess with a date ten years ago.

The two students decided that it was too late to try and find out who the girl in the photograph was, so they went to a motel in the city to get some sleep. The next morning they would go to the register office in the city hall to look up information about Tess. When they tried to get separate rooms, the man at the motel desk told them that there was only one room available. They would have to spend the night together.

Thomas had never looked at Megan as anything more than a simple classmate. That sensation had disappeared in the last two days. He had begun to see her as a fragile being that needed someone to take care of her and Thomas saw himself as the best candidate for the young woman.

Upon opening the motel room, they found only one bed. Megan seemed to blush at the opportunity that lay ahead. She had started to have feelings for Thomas a few weeks ago, before the doctor's death.

After almost three hours discussing the variables and possibilities of the doctor's investigation, they decided it was time to get some rest. They turned off the lights and everything seemed to be going okay until Megan put her hand on Thomas'. He did not mind and he did not take his away. Thomas moved closer and gave the young woman a quick and bold kiss on the mouth. She received the kiss nervously, but thrilled.

They slept holding each other's hands and still feeling the kiss on their lips.

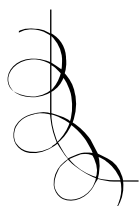


The next morning they both woke up with a smile. It had been invigorating to know that they both had special feelings for the other, which helped them begin getting over the grief of the doctor's death.

The first thing they did that day was go to city hall. They got there thanks to the directions that the motel manager had given them. It was a white building with a lot of white columns and a pretty park in front. They went inside straight to the register's office where a Miss. Ann helped them politely.

– Hello. We are two Bioscience students looking for information about samples that have arrived at our laboratory. – Thomas said, trying to fool the secretary. – We only know that her name was Tess and that she died about ten years ago.

– Normally we don't let anyone have access to that information without previous



permission but Dr. Walter told me to help you as much as possible. – Megan thought it was strange that the doctor knew about Tess and had not said anything. – I'll see what I can do.

The secretary was gone for about fifteen minutes while the two students talked about who they thought Tess really was. They made a small bet in which the prize was something simple: a wish. Thomas thought she was Mage's wife, while Megan believed she was just a friend.

– Here are three reports corresponding to three women by the name of Tess that died ten years ago. You have half an hour to look at them and then you must return them. Remember that what I'm doing isn't legal.

It only took them a few seconds to realize that the Tess they were looking for was the one in the second report thanks to the photograph that they found in the doctor's house. They took advantage of every last minute that Ann had given them to analyze every detail in the woman's report.

According to the information, she was married eight years to Dr. Mage until she died ten years ago due to a cancer that pursued her the last years of her life. There was another interesting piece of information. It was the address where the doctor moved to after his wife died. The change of address was registered exactly one week after Tess' death. It was evident; the doctor had left the city after losing his wife.

Thomas was not only happy because they were advancing in their investigation but also because he could make a wish and he already knew what it was going to be.



Megan and Thomas were having dinner in an expensive restaurant in their city. It had taken them half of the afternoon to get from the doctor's previous residence to the young woman's house and once they had arrived he took the risk of asking to have his wish come true: a dinner with her.

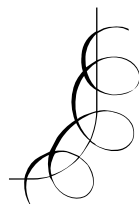
And as a promise should always be kept, there they were. It was strange. They were used to talking about plant physiology and cancer so it was a challenge for the two of them to speak about their lives outside of the laboratory. They felt strange realizing that they were not that much different than Mage: they did not have anything outside of work.

In spite of everything, they managed to have a nice time, talking about their hopes and dreams. While the wine bottles emptied, they talked about their interests and hobbies such as that Thomas had a passion for playing the piano and Megan missed being a ballet dancer in the city's school of dance.

When it was getting late, the two students noticed that the restaurant owner had been waiting for them to leave in order to close. It was getting late anyway and the next day they had to decide what they were going to do with the information they had found about Tess and Mage. There were still a lot of questions that had to be answered.

Thomas took his classmate home to drop her off and it was when they were going to say good night with a simple kiss, maybe under the influence of the alcohol, Megan grabbed her friend by the neck and gave him a burning kiss filled with passion.

- Even though I didn't win the bet... – started Meg. – Could I make a wish too?
- Of course.



– Come upstairs with me.

In the elevator the tangle of kisses and sensual caresses began and the passion was unleashed once they got into the young woman's apartment. The passionate madness and uncontrolled frenzy was constant until the early hours of the morning.

Someone rang Megan's doorbell. Thomas was the first one to hear it. He got up, gave Meg a kiss on the forehead and went to ask who was at the door while she stayed in bed where the night before they had shared all of the love they felt for each other.

It was Dr. Mage's lawyer. He had stopped at Thomas' house first and after seeing that he was not in his apartment, went to Megan's. It had to do with the doctor's will.

Megan and Thomas received a generous sum of money as the doctor's only heirs with the simple condition that they would continue with the experiments that he had started. They also received the keys to Mage's house. They had a place to continue looking for information.



The two students got to the front door of the last house where the doctor had lived without Tess. Just when Megan was taking the keys out of her purse, Mrs. Genovese appeared with a smile on her face.

– I knew who would receive everything that the doctor had. – She seemed happy with the doctor's decision.

When they went inside they noticed how spacious it was and the amount of precious light that came in through the windows that took up the entire wall of the living room.

They did not have to investigate too much to see the letter that was for them on the living room table. On the envelope it said: *To Megan and Thomas, in case something goes wrong.*

Thomas did not doubt for a second and opened the envelope and started to read the letter that was inside. Mage, with his meticulous penmanship, had written a few paragraphs dedicated to the children that he had never had:

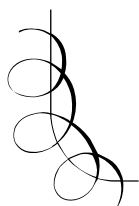
*'Dear students and children of mine,*

*If you read this it's because I am no longer with you and that time and the illness have won the battle. I imagine that my lawyer has already let you know about my decision to give you everything that was mine. I know that you will use the house and money intelligently.*

*There are many things that I should have told you and never did... maybe to not show my weakness. A father should be support for his children, never a burden.*

*I was married once, yes, to the most special person I had ever known: Tess. She died of a terrible cancer that devoured and consumed her to inhuman limits. The worst thing of all is that I let her down.*

*When she was in the terminal stage I managed to obtain some very promising results for the cure of cancer on mice and other experimental models. We were going to continue to the next phase when Tess insisted on being the first patient to try the synthetic bacteria. She said she trusted me so much that she was absolutely sure that it would work, that I couldn't be wrong.*



*But I was. The treatment was a failure. I made her believe that everything would be okay and later I let her down. The cancer won the battle and she passed away. The same thing happened to some other people.*

*I couldn't withstand the pain for having destroyed their lives and the lives of people around them. I was guilty of offering useless hope and the suffering of having lost my wife went on forever.*

*I made a change of scene to a new city to try and detach myself from everything that tied me to her. After a year I was able to get over my investigation phobias and I started working in the laboratory where we were working at present.*

*I developed a biosynthetic element again capable of doing the same thing as the previous bacteria. This time it was a plant, a bit more stable than the previous microorganism and facilitating the treatment by eating the fruit.*

*My greatest fear was obtaining the first positive results in the animal tests. It was then that I had to think once again about experimenting with humans.*

*I wasn't capable of bringing hope to people with a new promising drug without them ending up like Tess. For that reason I did what I felt I had to do: a self-induced cancer.*

*If you are reading this, it means that something went wrong. Either the fruit didn't work correctly or I didn't measure the advancement of my cancer and I died before I could use the drug on myself.*

*I only ask you one thing. Check and see if it works. If it works, the world will be a better place, and if not, you'll have to keep looking for a solution. But please be careful to whom you offer hope. Hope is the last thing that one loses...if you lose it life goes with it, leaving everything behind.*

Mage'

While Thomas read the letter out loud Megan cried from line one. The young woman's tears started falling when she heard about Tess' sad story and then even more when she heard about her boss' sacrifice.



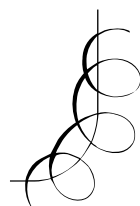
The next morning after the intense day at the doctor's house, the two students were alone in the laboratory. Megan was holding one of the "miracle" fruits that the doctor was going to try moments before his death.

– Are you sure we should do it this way? – Megan had doubts about the plan that Thomas had thought up.

– You know he would have wanted it this way. – The young man said this while he took out a potent toxin that they used to induce tumors in laboratory animals from a special refrigerator. – If we don't trust the doctor, who will?

The plan began the moment that Thomas drank the entire bottle of the toxin. Megan couldn't stop crying while she watched him. He had taken enough of the toxin to develop multiple tumors in a week's time. Megan would control the progression of the tumors and monitor his vital signs. Besides, she would take cellular samples from accessible areas such as the skin to see if they obtained results that allowed them to use the synthetic plant on people without giving them false hope.

And indeed, in a week Thomas had developed uncontrollable colon and skin cancers. It was time for Megan to give her friend the fruit. He ate it effortlessly.



Maybe they had induced too strong of a cancer.

The next three days were hell for Megan. Thomas struggled between life and death. He did not seem to improve. The blood and skin tests showed no signs of improvement and the proliferation was still out of control.

Everything changed on the fourth day.



Thomas began to recover. All of the samples improved, reducing the uncontrolled cellular proliferation and eliminating the centers of malignant cells. From the looks of it, the fruit of the *Megium benigna* was a great success, almost a miracle. A week after ingesting the remedy created by Mage and them, the young man was healthy without any negative side effects. Megan celebrated it by giving him a long kiss, the most passionate kiss she had ever given to the young man with crazy ideas that had become the most important person in her life in a very short period of time. She was not capable of imagining what would have happened if he had left her. She could no longer imagine her life without him.

– Why do you think it took the lawyer so many days to show up? – These were the first words that Thomas said after the kiss. – Normally they don't take so long...we were investigating things that we could have known from the beginning if we would have read the letter right away...it was as if the doctor wanted us to look for it...

– I think he wanted it that way. In case something happened to him, he would give us some days to investigate and that way get to know each other in a different way. – Megan spoke in a convinced tone. – He probably did it on purpose. It was his last gift: he helped us find one another, like him and Tess.

Now they knew that the fruit worked and showing it to the public would not give false hopes. The doctor would have been proud of them, thought Thomas. The three of them had achieved their goal.



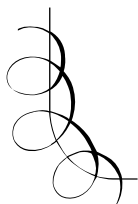
Two years after Mage's sacrifice, the world was a new place. Cancer was no longer the main lethal illness and there was a rumor that it was going to be declared as disappeared, not only because the fruit eliminated the illness but also because it prevented it with rotund success.

The cure was commercialized at no cost thanks to Dr. Thomas and Dr. Megan, one of the married couples most talked about on a daily basis. They managed to put it into circulation thanks to the money they inherited from the main discoverer of the *Megium benigna*.

The Nobel Prize in Medicine was awarded to Thomas and Megan and for the first time in its history, it was awarded with posthumous distinction to Dr. Mage. The speech given by the two young investigators was simple and clear: They thanked the doctor for everything he had taught them as scientists and people.

The text ended with Thomas reciting a few words in his boss' honor that, if he had been there, he would probably have said:

– This prize is dedicated to the hope that kept her alive up to the last moment: To Tess. To her and the unconditional trust she always had in him.

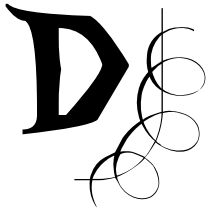






# THE SPARK OF LIFE

ORIGINAL IDEA *Alex Valero*



r. Joseph Lehman exited the block of 'nest' houses like every morning. He had argued with his wife again; she did not understand his obsession with the laboratory work.

He took his usual five-minute walk to the everyday-metro station and he had to run so the doors would not close. He traveled sitting between a young boy, with his "light-knapsack" and his augmented reality glasses, and a lady who tried not to fall asleep as she hung on with apparent worry to a bag of medicines.

Without noticing it, he started to divagate about how he had gotten to that point where he exchanged more words of anger than love with his wife.

Since he finished his thesis about Energetic Biology about 8 years ago and he had been offered a main research position in one of the most prestigious institutions of the planet, he usually worked around 14 hours a day. The situation required it. The world of science had drastically changed during the last century. Left behind were the years when basic and applied investigations went hand in hand. Now, inversions were only made in applied science, not for humans but for the production of efficient energy exclusively. This situation also meant the appearance of new illnesses that nobody seemed to try and alleviate, so some parts of the population did not even have a life span of 30 years when the normal life expectancy in the year 2377 was of 181 years for the few people that could afford to pay for the expensive and almost inexistent medications.

While Lehman kept on thinking about how the planet worked, young Harrison listened and watched the Electrium concert through his newly-bought glasses, in rigorous live from the other side of the world. It was a good group. They had made electronic music popular with a reinvented touch of classical music, something Harrison really liked. At the same time he commented everything that was happening with his virtual friends. He loved no-delay connection and being connected non-stop. He was so into his concert that he didn't notice that his light-bag's indicator flickered red.

The energy still was being consumed by the excessive requirements of the young man and did not take long for it to run out. It was like pressing the red button of madness. When Harrison saw himself disconnected from the network, he began to feel naked and misplaced. The real world was too heavy. At that moment, only one thought haunted his mind. Getting energy was more important than even breathing. But there was one problem: his bank account was empty. He didn't know how he was going to pay for the new doses of energy. He turned to the man who was sitting by his side; he had to be able to pass him some of his energy.

Lehman woke up from his wandering in which he floated because of the young man to his left. He was looking at him with dilated pupils; he seemed suffocated.

–Hey dude... I need some... some energy... I could pay you back. – Lied Harrison to Lehman.

–I’m sorry, boy; I’m not signed up with any energy plan. – He was offered one almost every day but he used a telephone and computer around 15 years old. He sacrificed power, but he gained in not having to charge them every hour (some business genius discovered 10 years ago the great deal that minimal-charge batteries would be).

–You gotta give me some! I need it! –The teenager was getting aggressive.

–I can’t give something I don’t have. –Lehman looked away.

As a result of his final comment, Harrison exploded and started beating Lehman. Luckily for Lehman, through the corridor came a man dressed in a suit, head completely shaved and with a huge knapsack that showed turbines, fans and blue flashes. He was a ‘Charger’. It was the only way of getting rid of the young man.

–Stop, kid! Stop, please! –begged Lehman– There’s a Charger over there! I’ll pay for your doses!

Harrison suddenly stopped, took some type of plug out of his bag and started running towards the suited man that connected the plug to his generator. The boy started to calm down.

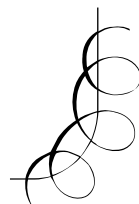
As promised, Lehman paid the exaggerated high price imposed by Electrocorp, a company that had the monopoly of almost the whole world. It was stupid to try and understand how the situation got there.

When fossil energy sources ran out, renewable sources were highly supported. This situation could have been handled if it wouldn’t have been for the enormous population growth.

But this was not the only problem. Since the XXI century, technologies started to develop even faster and the obsession of having the latest devices ruled the youngsters’ minds, always more prone to follow trends. In addition, vehicles and houses also required energy. In this way, putting together the excessive number of teenagers, with maintaining the established habits and the absurd obligation of the electronic style, every attempt of using renewable sources as the main energetic reference was shattered.

In this manner, the only energy that was strengthened was nuclear. The only problem was what to do with all the residues. They had an easy answer: send them to space. These expensive techniques entailed the decline of less wealthy companies that could not afford sending rockets that never came back. Like this, electricity companies disappeared little by little until only one was left: Electrocorp. This company knew how to invest and obtained huge profits that allowed them to have almost daily launches. The only downside was that prices soared to maintain this energetic model.

This meant that light became a luxury good and some sectors of the cities lived with candles and completely disconnected. In these parts lived people known as ‘Fireflies’.



Despite of the absolute monopoly, Electrocorp started to look for an energy that could produce a higher benefit. For this, they “donated” enormous amounts of money so that laboratories started to find an alternative. Up to that moment, nobody had achieved it, but to be honest, Lehman was very close to being the one.



After the metro incident, Lehman arrived to his lab without problems, entered his office and turned his computer on. The Electrocorp logo appeared on the screen. He had a slight feeling that they had the control of the private data he used, but he could not say anything since they were the ones who controlled the money. Once logged in he started to write the report with all his discoveries up to that moment so he could send it to the coordinator of energetic investigations (absurd name taking into account that no other investigations were made).

*Day 1,819 in the search of Bioenergy:*

*Yesterday, after almost five years of investigation, the first results were obtained. The synthetic bacteria with adapted genes from Electrophorus electricus (electric eel) and Vespa orientalis (oriental hornet) have given the first positive results in the production and storage of electricity. It has been a hard road, but the multiple modifications made in the organism (ultra resistant membranes and high conductivity proteins) are capable of making it ‘immune’ to the electric current that they produce. The high voltage current originates from artificial membrane systems, created synthetically, named as Sacs organelles and Hut organelles (due to its design based on the organelles with the same name that make Electrophorus electricus capable of producing electricity) in response to a quorum- sensing process.*

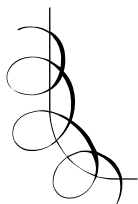
*Yesterday, we finally achieved the spontaneous generation of energy controlling the population characteristics, nutrients concentration and light.*

*Placing cultures of the microorganisms over conducting plates, 12x12in, we can produce enough energy to power a domestic installation continuously without problems. The energy produced is clean, does not generate any residues and the culture grows unlimitedly if it is controlled by a chemostat. In addition, the energy can be stored in the cell itself and liberate it when it is needed by just changing a determined group of salts in the medium.*

*Without a doubt, we find ourselves before a new source of energy: cheap, clean and extremely efficient. This new synthetic species will be called Bioenergia voltaia.*

Dr. Lehman was incredibly proud of his new work; he had resolved the most challenging project of his career. After failing in his last investigation (the extraction of photosynthetic energy from plants) he had learned to get up after falling, and this time, he reached higher than ever.

The doctor’s new interest was to know what to do with the results now. His bosses were already aware of his achievements, but he had to be careful anyway. During the last months some scientists, known as ‘insurgents’, refused to collaborate. They were brilliant minds, with excellent jobs, but did not share the multinational’s



ideas. They were not in favor of giving their investigations so that the company could gain exaggerated amounts of money. Therefore they tried to spread their ideas through the internet to see if they could get to more people willing to help them without only thinking about money. The problem: they never got to develop their ideas. Electrocorp took care of the matter and silenced all the scientists in ways nobody ever discovered but at the same time everybody knew. Every man has his price and, sooner or later, all the 'insurgents' came out declaring that they had sold their investigations to the company and the investigation, as a result of the patent, became private property.

Lehman knew that his investigation was revolutionary and that in no time somebody would knock on his door with a big briefcase full of money to compensate the fact that his work no longer would be his.

But he rejected this idea; he had to think about how to avoid this. He did not want to encourage the exploitation of the people's basic needs. He had always believed that being a scientist was not a job for one's own delight; it was, beyond everything, a service to the world. And as all services, it had to get to everyday people by the easiest, most comfortable and cheapest way, to improve their life.

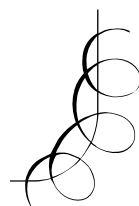


Going back to his 'nest', Lehman thought about how he could transmit his discovery to all the people. Maybe, he could create a web page where he explained how to take care and control the *Bioenergia* culture. After a short tutorial and the product description, the cultures could be sent home receiving an extra free growing plate. He would not demand any money, only the buyer's charity. This way he could maintain the service, keep developing the system and, if possible, pay Electrocorp to dissociate from them. It was a very motivating idea and he thought it could be a total success.

He finally reached his 'nest'. Before, they were known as normal houses. However, Electrocorp started to privatize them as a business, at first sight, beneficial for the buyers. 'If you live in an Electrocorp nest, your light will be free!'. Thus, nests became more famous because paying the electricity bill in a normal house was extremely more expensive than paying a nest's rent. Besides, normal houses suffered a gigantic increase in their taxes that made no sense and made living in a nest even more suitable for most people. This way, Electrocorp got to control everyone's life from even closer.

He rang the bell; he always did it when he got home so Judith, his wife, did not get scared. Once he did this usual routine, he opened the door. He heard voices in the small living room (the bigger nests were not compatible with the adjusted salary of a scientist) and when he got there he saw two men with suits and no hair, talking with Judith.

—Good evening, Mr. Joseph. —said one of the Electrocorp workers with no expression but trying to sound friendly, while drinking coffee in a teacup that was a wedding gift.



–I prefer to be called Lehman. And if it's possible, without the 'Mr.' in front.

–Oh well, OK: Dr. Lehman. Is that better? –He said in a mocking tone– Today we received really interesting data from your lab. We were only coming by to remind you of everything you owe to our company, the same one that has financed your proj...

–I don't owe you anything. I'm sorry but I'm not giving my results to a bunch of people that only take advantage of the people's basic needs. I'm sick of seeing people dying because of the poor medical financing and seeing the 'fireflies' begging for wick for their candles. And not only that! You have thousands of young people wasting their lives, connected to devices and believing that there's nothing else beyond them. Just today a young boy almost killed me for a miserable dose of...

–Slow down, slow down! –said the other man. – You have already made your point. We won't annoy you anymore. We are changing, you know? You are free to offer your data as long as you pay the 'free science' fee. It's a new concept we are establishing.

–OK, how much is it? –he asked as he took out his checkbook.

–A 250% increase in your electricity bill each month.

They were playing with him. They knew he was not able to pay for it, that way he would hand over all his investigation and they could make a profit out of it.

–I can't do that, I can't afford it. –Lehman thought quickly on a way to get out of the problem.

–Then you have to be at the central office first thing in the morning. You will have to give us a model to follow the '*Bioenergia*' project.

Lehman did not even want to think about what would happen to him if he refused to give the results to the main investors of the project. It was true that they had paid for it, but they lost all his respect when their only interest was to make a bigger bubble out of it. A bubble, that seemed as it was never going to explode.

He was not going to give up; he refused to contribute to that situation.



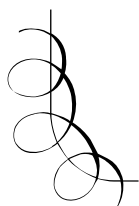
The next day, Dr. Lehman went to his laboratory. He searched through the internet from his personal laptop, bought a domain and on his new webpage started to type. He described step by step what was necessary to make the most of the Bioenergia. He created a shop where he offered the strain, the culture-conducting plate, the necessary cables to connect it to the nests and a manual to grow and take care of *Bioenergia*. The web's design was not very attractive, but the main objective of making his results public and free was coming true.

He had to start preparing the boxes so he could start sending them. His salary would probably vanish but he was contributing to taking a small step towards a better situation.

Just when he was going to click so that the webpage became public, the monitor blacked out. A few seconds later, a message appeared:

*'A man is taking a bath with the radio connected and on the edge of the tub... What do you think will happen?'*

He felt he was not alone; bang on the head; black.



That was the order of the feelings Lehman had after discovering that Electrocorp's control went further than he could ever have imagined. Two suited men, with a tie and no hair had entered the lab silently and hit the doctor on the head with a bat, in a coordinated act with the computer controllers.

While he was unconscious, a blood sample was taken.



Lehman opened his eyes; he felt his extremities numb because they were tied to the metal chair that was screwed to the floor. He was trapped between four brick walls and he would have been in complete darkness if it hadn't been for the twinkling light that came from a television near him.

—Hello, Mr. Joseph Lehman, doctor in Biological Energy. You have been playing with fire, and whoever plays with fire... gets burned. —said a tenuous and distorted voice to sound lower than it really was.

—I should have shown my results sooner...

—You have acted in such a stupid way. You are still in time to enjoy great amounts of money if you want. We already have your results and the truth is that they are quite revealing.

—I know you will end up killing me. What is it worth being the richest man in the cemetery? —He still did not know why they were still keeping him alive.

—We will be sincere; it would not be intelligent to lose a scientist of your level.

Keeping you alive and working by our side could mean an important advance worldwide and economically speaking. We give you all the money you need and in exchange, you give us your ideas. If you don't, you will end up being an insurgent.

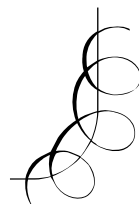
—I would be selling my soul to the Devil. I refuse! —Lehman was sure he was not going to collaborate with that world.

—So I hope you don't find yourself surprised when you end up being a firefly, or even better, a cadaver. —The background noise cut off, letting Lehman know that the person on the other side had disconnected.

Time passed by in a very strange way in that room; on top of this, he fell asleep without noticing it, which provoked even more instability. Sometimes he was starving and in a split second he felt like he had already eaten. Two days had passed without having a bite to eat and he could tell because he felt extremely exhausted. He did not even have the possibility to go to the bathroom. He felt like an animal, but probably smelled worst. However, the worst thing was his thirst, uncontrolled, that made his mouth so dry that he could not feel his tongue.

He knew everything played a part in the company's plan for him to end up doing what they wanted. At least, physical torture did not appear on the scene yet.

The television turned on without any sound, showing the news from the private channel, EC, with its usual midday host. The first news was shocking. It showed a picture of Joseph Lehman with the headline: *'Scientist murdered by his wife'*. They also showed a video of the paramedics taking the covered body on a stretcher through his house's front door. In a different era, it would have been a tacky way





to show the news, but at that moment in time it was something completely usual. They even did a close-up of his face with a bullet through his forehead. That man was him without a doubt. The last image was Judith at the police station, with the striking phrase: *'The neighbours assure they did not get along. Judith could face the death penalty'*.

Lehman's mind was an erupting volcano. Judith incriminated for killing him? It was absurd; everyone who knew them would know it was impossible. Despite the arguing, they were madly in love. They could argue before went to work, but when he came back and told his wife about his discoveries, you could see her eyes shining with pride.

The worst thing was figuring out how he could be on the news and at the same time in that dark room. He sensed the answer. Cloning humans was prohibited in almost all the countries due to its complicated ethical issues. Nonetheless, some developed countries, trying to gain more money, legalized it. This meant that a lot of rich people, who for example needed an organ transplant, travelled to those countries and got their own personalized clone (just starting with a DNA sample) in order to have an organ that did not give any problems and to get rid of the long waiting lists. Once the cloning technique was optimized, the next goal was getting an individual who reached the necessary age as soon as possible. It was easy: scientists stopped using human wombs to develop a whole body. The fetus was incorporated in a 'high metabolism' chamber where the cloned individual grew at an unimaginable rhythm controlling its development and cell expansion and also adjusting their aging. Thus, in less than three hours, you could have a 40-year-old man.

In addition, this could explain some of Lehman's doubts. He figured out that probably all the insurgent scientists that ended up selling their results, in reality were assassinated and substituted by a clone who signed the false contract selling the results.

He already knew what he had to do. He had to escape, get to the public and show the world that he was actually alive. He had to demonstrate that Electrocorp had used cloning techniques to accuse an innocent woman of killing her own husband, who oddly enough was going to revolutionize the energetic panorama of the moment. With this, he would probably be able to dismantle the universe created by an unscrupulous company that used all the scientific progress to gain money. But first he had a more important problem: how to escape. The company surely had optimized security protocols and a whole army of security personal.

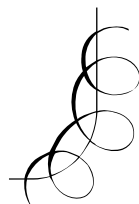
He thought about it for a couple hours and finally reached a hectic idea that could turn out perfectly or completely the opposite. At least, he could say he tried.



– Hello? Can someone hear me? I want to make a deal. –Lehman tried to get in contact with his kidnappers.

–Tell us about it. –answered the distorted voice.

–No, I need to discuss it in person. I think I deserve that right.





–OK. –Lehman was surprised by how fast they accepted, but thought he had achieved his goal. – We have already sent an employee; please wait for 15 minutes.

In a while, a woman with short blonde hair, sharp features and blue eyes entered the room. She was wearing a suit that let you sense her exercised and sculpted body. Her looks were cold and serious, as if she was a robot from a production line but really humanized. Lehman considered for about five seconds the fact of her being an android (it would not surprise him considering what he had already seen) but he discarded it when he saw how natural her movements were.

– Good afternoon Dr. Lehman. I'm Aidiv Norton, the director. I've been informed that you want to collaborate with us. –Her voice was like her looks; cold and linear. It seemed like she was saying it by heart.

–I'll give you all my investigation; I don't want any part of it. The only thing I want in exchange is that you set my wife free again. I know you can do it.

–You still don't get it, do you? –Aidiv started to laugh in a fake way. Lehman imagined it was part of the act. –We don't want your results.

–Excuse me? –He did not understand anything.

–Think about it. Why would a company that controls the electricity, housing, entertainment, transport and even the government want to commercialize an energetic model that could be given away amongst friends, neighbours and family? – She obviously made a point. The fact that the model was based on a bacterial culture meant that his energetic model could be passed on hand by hand. You only had to take a small part of it and leave it growing in a different place to share it without problems. –We are not where we are thanks to free products which distribution we cannot control.

–And all the population? Why don't you at least try to help them?

–Our company has grown a lot. If we want to 'improve' our employee's lives, we have to think as we have been doing until now. If you were referring to the fireflies, sooner or later they will get used to the world that Electrocorp has organized.

–But a lot of people never get out of the suburbs! They would be happier with just a vehicle to go to work! –He suddenly felt naive for thinking that Electrocorp was managed by human beings. It was obvious they were monsters that only fed on people's misery.

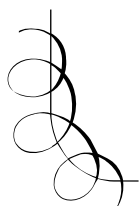
–Darwin... the laws of evolution. Only the fittest survive. You should be familiar with that, doctor. Time will put everything in its place.

His plan was initially based on the fact that the company wanted his investigation; he never considered that they actually wanted the opposite. Now, he did not have anything to negotiate with and Judith and he would probably die. But there was a piece missing... he was still alive.

–Why am I still alive then?

–It's quite simple. We have a really brilliant group of investigators but not enough as to design a way of obtaining money with your energetic model. Our idea is to put them under your eye and that this group is able to find a way to use *Bioenergia*, but always being capable of controlling it and obtaining benefits. –You could tell that Aidiv enjoyed watching Lehman suffer – If in less than 72 hours you achieve a way of obtaining money from your experiments, we will set Judith free of all charges and we will give her a peaceful life with all expenses paid.

–And what will happen to me after that?



—You'll have to keep working for us. You'll have a salary in accordance with your status and scientific freedom up to some degree, which will be for sure of your taste.

—But for the world... and my wife... I'll be dead, won't I? —Lehman could not even imagine how his wife's mental health would end up. Absolutely lost; without knowing what happened around her. He had to think fast. —I accept the deal. —He had to agree with them if he did not want to spend more time tied to that chair.



Aidiv untied Lehman and told him to follow her. She took him through corridors that were not well illuminated until they got to an elevator that they used to get to the 18<sup>th</sup> floor. There he was able to take a shower and finally change his stinky clothes. Then he got out of the bathroom, there was a table waiting with a bare plate of food and a pitcher of water. He did not even use the glass to drink; he needed all the possible water for his thirsty throat. After this, he sat down and ate the plate he had in front: an austere chicken breast with two slices of lemon and a few potatoes.

When he had finished, they went back to the elevator and to the 23<sup>rd</sup> floor. There awaited an enormous laboratory, all grey and white, where almost a dozen of people worked. He turned around to talk with Aidiv; she had already left. It was obvious that the company thought that Lehman did not need any more information, except that he had to manage a way to make *Bioenergia* private. If not, his wife would die.

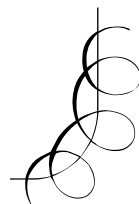
In less than an hour, he already knew how to avoid sharing the bacteria. It was a really easy idea that he did not understand why they hadn't come up with faster. This surely was due to the fact that all the other scientists only had knowledge about energy and probably only had basic Biology concepts.

His idea was to modify the bacteria in a way it would automatically die. A determined auxotrophy would be added to *Bioenergia voltia*. It would be a new auxotrophy never used before: a synthetic compound of their own creation, necessary for the bacteria to live. This new material would have an unknown composition, so they could gain money out of it because it would have to be bought in specific places. In addition, this necessary compound would have an extra quality: it would program the cell to auto-destroy itself to avoid sharing it.

He started to give orders to his people. The workers were distributed in different working groups and he asked for their maximum concentration and coordination to obtain fast results. His only interest at that moment was saving his wife. Afterwards, he would think about a plan in which he did not help to enslave a world that was helpless enough.

Next day, Aidiv appeared at the laboratory. She carried that day's newspaper with a headline on the front-page that said: '*Judith Lehman has been declared innocent of the murder of her husband. The doctor committed suicide while his wife was outside the house*'. They had kept their promise. Now it was his turn to make his move.

—Miss Norton, we almost have the 'user's block' for our bacteria. I would like



to know if, once everything has finished, I could take my wife and leave far from here. – He was asking for a favour.

–I’m sorry, Lehman. – She did not seem to feel sorry at all. – But we can’t take the risk of letting you go. We would never be completely sure that you don’t decide to go on with your web page and start sending unblocked *Bioenergia*. One bacterium would be enough to destroy our empire. You can understand our attitude, no?

–Yes... I guess it makes sense to you. –Lehman already suspected that he was going to receive that answer; but he asked for one last thing. –Could you at least give this letter to my wife? – He had prepared it last night.

Aidiv grabbed it and took a look at it to see if there was something suspicious. The letter said, with sincere words:

*‘I’m sorry I had to leave and abandon you without a notice. The last thing I thought about before leaving was the letters we sent each other when we first met. I love you with all my heart and soul, Judith.  
Joseph.’*



Judith was watching the television. She had spent the last days wandering around their *nest* without knowing what to do. Joseph was the only thing that haunted her mind; a thousand of theories about his suicide were possible.

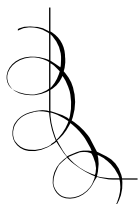
On the television they only talked about the new ‘Bioenergy’. Cleaner, natural and more efficient. But she knew the investigation belonged to her deceased husband. The Electrocorp monsters were getting richer every hour with her husband’s work. Judith knew he was against this, so she did not even bother in opening all the checks she received as compensation.

But that day she got a different type of letter; it did not have a bank stamp or an Electrocorp one. It was written by Joseph. She hurried to open it, almost without thinking. Her hands trembled with fear upon the fact that she did not know what she was going to find. There, with Joseph’s stylish handwriting, she could read:

*‘I’m sorry I had to leave and abandon you without a notice. The last thing I thought about before leaving was the letters we sent each other when we first met. I love you with all my heart and soul, Judith.  
Joseph.’*

Suddenly she realized something. There had to be a hidden message. When they were young, Sven and Violet, Judith’s parents, did not approve of her relationship with Joseph. He was studying to be a scientist and everybody knew it was a career from which you could not expect a lot of recognition. Her parents thought a good husband should be an electric engineer or an electrician to have a permanent and high salary.

To avoid that her parents found out about their relationship, Joseph sent letters as the Readers Club with information that seemed to be publicity at first sight. However, the Readers Club’s letters hid secret messages. If you took a candle, its heat showed a message behind the original writing. It was as an old children’s trick,



as easy as writing with lemon juice.

She looked for a candle in a drawer. At first, she suffered when she thought it might all be a false alarm because it was something they used so long ago. She lit the candle and brought the paper closer. With the heat, scrawls began to show:

*'Judith, I'm still alive. Electrocorp has been carrying out illegal activities. They have kidnapped me to make sure I don't set free Bioenergia voltia unblocked. They attacked me in my lab and cloned me to fake a suicide. They incriminated you and threatened me with letting you die if I didn't work with them.'*

You have to help the world know the truth. Give them the light they need; show them the truth.

I'm trapped in one of the company's building, but I don't know in which one. I only know I'm in the 23<sup>rd</sup> floor.

I need to see you and end this torture.

I love you,

Joseph'



Lehman counted 13 days in the laboratory. After achieving the bacteria's blocking, they started working on another brilliant idea Aidiv had: how to create synthetic plants capable of regulating the oxygen production to substitute the natural ones and charge for the new ones.

While he thought about a way of placing molecular switches in the plants, a scandalous racket surrounded the building. He went to the window and saw, with great confusion, how thousands of people called out: 'Freedom for Lehman!'. They had banners and signs with messages against Electrocorp and their methods.

Just in time, Aidiv entered the room and screamed:

—What the hell have you done!/?

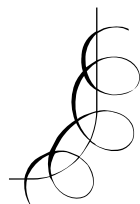
Lehman took advantage of the door Aidiv had entered through and that had kept him prisoner. He pushed the door and ran towards the elevator. The security alarm started to sound and all the security personal looked for Lehman, but they got to him just when the elevator door had completely closed.

Between each floor seemed to pass an eternity, until the 8<sup>th</sup> floor where the elevator suddenly stopped. They had cut the power off. Lehman opened one of the ceiling panels and climbed up on top. There he found an emergency ladder and kept on descending.

The ladder reached the floor and the EXIT sign shined over a door; he rushed towards the exit and appeared in the company's hall.

The entrance was infested with all types of police. Reporters from small independent channels also waited with their cameras. All of a sudden, Lehman showed up through a maintenance door.

As he came out, the officers surrounded and protected him from the mass of people. Meanwhile, the public acclaimed and cheered. Lehman knew he was safe and sound and finally had made it. He could now uncover all the lies that were the



foundation of Electrocorp.

Through the extreme amount of people, a passageway was created; Judith ran towards his arms. They once and for all found themselves in a long hug that ended with a sincere kiss full of affection. After this, Lehman could only repeat the same two words: *Thank you.*



The government, tired of being under Electrocorp's orders, carried out a long and arduous investigation as a reaction to a woman that began to move heaven and earth through internet and means of communication. During the raid were discovered horrible crimes as the murder of innocent scientists, kidnaps, cloning processes and non-orthodox methods for such a powerful company.

This investigation culminated in the closure of the multinational and the detachment of all its relations with housing, communication media, transportation and entertainment.

All the houses now received free kits, distributed by a new company known as J&J, which allowed the installation of *Bioenergia voltia* cultures in each house. It shared all the advantages with the previous electric model but had one special added benefit: it was totally free. It was such a revolution that the own dealer encouraged everyone to share it with their beloved ones.

The change had started: The fireflies finally got the chance to see a light shine again in their houses and some even saw it for the first time in their lives; the scientists were finally able to choose the branch of science they liked the most; medicines were improved and less expensive; J&J and other new companies financed detoxification centers for 'energyholics' and like these a long list of quality of life improvements.

Step by step, the social differences and the venoms which infected the population's minds were diminished and the world recuperated its spark of life.-

