

Prisoner of Eternity



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by Marcio Tex

Immortality was not worth the suffering. I would rather be dead than have to face it—again.

It started with a modern myth arising from our belief in the righteousness of science and our understanding of the world based on our technological prowess. The myth stated that if humanity amassed enough knowledge, we could create paradise on Earth by controlling all the elements and events of ordinary life, making the most powerful of gods blush in shame. Better still, such power would confer on us a faculty that humans had dreamed of since the beginning of time—conquering death.

Indeed, one dogma of the myth held that organisms were algorithms and all living systems would answer to mathematical formulas. Therefore, given the right stages of development in biomedical sciences, genetics, gerontology, nanotechnology, informatics, and other fruits of the Tree of Knowledge, immortality would be in our grasp. At some point, someone thought it was already feasible. The concepts were in place, but an essential thing was missing. We needed to establish a scientific method to tackle the problem, and we would need to test it. Well, there was only one way to see if we could make humans immortal, and that would be by making one. Of course, it would take a while to know for sure if we could. My story began there. Ingo Zimmermann, guinea pig, at your service.

It was clear from the start that making one human immortal would be a national effort. The complexities were far too great even for the richest man in the world to try it alone. Some did. All failed. A team of scientists, universities, research facilities, and

laboratories was necessary that only the government could put together. It was amazing that Congress assigned federal funds for a project stretching far out of their sights. It was true altruism from those who kicked off the idea, none of whom would live to see its results. With the might of their will and capacities, they granted to one human being something they all wanted for themselves. A proposition was approved in 2050, and it was time to find a selectee.

The main premise stated that the experiment should start with the youngest possible candidate. Due to legal constraints, the subject had to give his consent. Hence, the selectee should be the healthiest person science could find in early adulthood. The selection process was extensive, especially considering the costly genetic screening each candidate had to pass. Nobody wanted to discover late in the project, after expending tons of money in preparation, that the subject suffered from some chronic disease or deleterious mutation that would derail the experiment short of any concrete result.

Running a nationwide selection process that time-consuming would be troublesome, but there was a solution at hand: The military could provide a host of young subjects with useful medical charts to help start the process. The rest was history. I was selected at age eighteen as a perfect match and hence started my personal journey toward the unknown, for the path was a lonely one fit only for me. Project Phoenix had begun.

I never knew the other candidates, or how many were competing with me. My indication was on a strict need-to-know basis. The heads of the project thought it counterproductive to turn me into a celebrity. For security reasons, I should remain unknown to the public, at least during the initial years. I discovered later that having a functional family weighed in my favor, whatever that meant. Perhaps our healthy

relationships, resilient foundation, and emotionally safe environment were the reason. They said it gave me the ability to withstand stress and recover more easily from trauma. It was indeed an advantage in the long run.

I remained in the military for the first two years. The Army contributed the discipline to carry on the mission and the physical training to keep me sharp. I never left the country. It was unthinkable to forward deploy me and risk my being shot at, exploded, or killed in some freak accident. Being immortal did not mean being invulnerable. Those were fine days, filled with naiveté and promises of a glorious future. I was not a celebrity to the outside public but was pampered all the same by those in the inner circle. It was stimulating at first, although I could hardly conceive what I had signed up for. That was one advantage of being young: I felt immortal already, without the need for external aid.

One thing sounded wrong from the beginning: the modern concept of aging. It flashed “no-go,” but people were not convinced yet, or they were not ready to face reality after what had been said and done—or else, they were simply determined to follow the quest wherever it led.

For some time, aging was treated like a disease, for which a *cure* was about to jump out of the mist. That was incorrect. Aging was maturing. Aging made a baby out of an embryo, a child out of a baby, a youth out of a child, and an adult out of a youth. During the process of aging, the body lived an intense period of orderly energy management, cell regeneration, and growth. The end of the process marked the climax of an organism’s physical and mental vigor. After the apex came decay. Continued aging from then on would be unnatural and mortal. There would be no room for the new cells.

Thus, we were facing something much more hideous than some kind of degenerative disease. There was no cure for the immutable laws of physics and the closed-loop cycle of nature. Every atom had a half-life, an unavoidable consequence of entropy. To change that, we would have to change the universe first. Chasing immortality would be the most difficult challenge humanity had ever faced. Far down the road, with the help of hindsight, it was amazing that someone had thought we could win, but with the amount of money and power involved in my project, the lack of clear sight among politicians, CEOs, and scientists came as no surprise.

An important part of the plan was preparing me to play an active role in the process. As time went by, I would be the living memory of the project. If I were also a scientist, I would assure continuity and coherence through many years to come. From some point on, I would be the sole survivor among the original staff—and their replacements, too. Therefore, I pursued a degree in biochemistry and a doctorate in biogerontology. I signed most of the late papers in the project. Investing in my formation was correct. We got this right.

Looking after my body was paramount. I had to follow a balanced diet and a rigorous exercise routine. Harmful substances were discarded outright, including alcohol, which I had access to only in small amounts and on special occasions. Every morning I woke up at dawn, did my high-intensity calisthenics, and left to my jogging. When I came back, I used a deep pore-cleansing lotion on my whole body before showering. Taking care of my skin had always been an important part of my daily routine because we did not have a plan to replace it. In the shower, I used a water-activated gel cleanser, a moisturizing all-natural body scrub, and an exfoliating gel scrub on my face. All the

products had no alcohol, because alcohol dried the skin out. At the end, I applied a gel facial mask, an anti-aging eye balm, and a moisturizing lotion for the hands. I repeated this little ritual every day for decades. I never thought I would miss it someday—but I did.

I was in the prime of life, and love came consequently. Janet was a scientist in the project, two years older than I was. I had few people to whom I could speak freely about my feelings and expectations. That brought us together, and soon we found we had a lot more in common. She enraptured me. I got married at age thirty, and life seemed wonderful. Janet adopted my daily care routine, because it would buy us time. We had three children together, who gave us eight grandchildren and fifteen great-grandchildren. Janet departed at age ninety-eight. She looked much younger; one would have thought she was seventy. “May life be light on you,” she told me before leaving. We knew by then how unbearable it promised to be. The elixir of eternal youth was a chimera. We never dreamt about it. One could not stop aging until the organism was mature, and one could not stop decay from then on. To overcome old age, I had to be upgraded, and that would not come from swallowing magic pills. The half-life of matter was upon us.

Now came the hard part—getting to business. The project bore one core statement based on a supreme ethical value. In pursuit of immortality, we should minimize suffering and maximize happiness. Wonderful! Who could object to that? Personally, I liked the idea, but never understood what it really meant, for my path was full of misery. We concluded by mid-project that happiness and misery were not mathematical entities and thus could not be treated as algorithms. For all we had deciphered about the mysteries of the mind, measuring happiness and suffering remained as elusive as ever.

There was no elixir of eternal happiness, as much as there was no elixir of eternal youth. Omnipotence slipped through our fingers, and the myth of paradise on Earth through science started falling apart. We could not control all the elements and events of ordinary life, true, but we could still pursue immortality. We mastered to a satisfying degree partial tissue rejuvenation and regenerative medicine based on stem cell application plus molecular repair, gene therapy, and organ replacement. We stood a chance.

Decay inflicted damage across the entire spectrum of life, from molecules, cells, and tissues to bones, organs, and body systems, causing a progressive failure of homeodynamics, the systemic preservation of homeostasis. Even worse, decay was continuous and affected the whole body at the same time, leading to genomic instability, telomere attrition, epigenetic alterations, loss of proteostasis, deregulated nutrient sensing, mitochondrial dysfunction, cellular senescence, stem cell exhaustion, and altered intercellular communication. We had to tackle the problem comprehensively, or failure would be inevitable. That was the reason we employed legions of scientists and prepared generations of brilliant minds to replace them—a national effort indeed.

One major issue was senescence, the gradual deterioration of functionality on the cellular and organism levels. Senescence leads to age-related loss of cell viability and increase in vulnerability. It is by far the leading cause of death related to old-age pathological developments in all kingdoms of life. Each time a cell undergoes mitosis, the telomeres on the ends of each chromosome shorten slightly, triggering a DNA damage response. Cell division ceases once telomeres have shortened to a critical length, reaching what is known as the Hayflick limit and causing senescence.

We needed to find a way to slow down, halt, or reverse this biological process. The answer came from cancer cells, which had an enzyme called telomerase that extended telomeres, preventing senescence and giving cancer cells infinite replicative potential. We were successful in developing genetically engineered telomerase activators to extend the telomeres of healthy, functional cells, thus extending their Hayflick limit. We would indeed give the upgraded cells cancerous properties, but cells of the musculoskeletal, circulatory, lymphatic, and immune systems responded well to this treatment with negligible risk. Those were our target systems for telomerase activation through gene therapy.

The strategy to deal with the major organs of other systems, such as the lungs, liver, stomach, kidneys, intestines, and glands, was cell therapy through direct injection of stem cells in affected areas, induction of regeneration by biologically active molecules (immunomodulation therapy), and repair of damaged tissue through cell-repair nanomachines. Once cells lost their ability to regenerate, mechanical and chemical exhaustion followed, leading to pathological conditions. We planned to transplant *in vitro* grown organs and tissues (tissue engineering) before this happened, and as a last resort. We extracted stem cells from my bone marrow, grew them into a large population, and engineered an organ bank tailored to myself, freeing us from the shortage of organs available for donation and organ transplant rejection.

Things worked well for more than eighty years. I avoided the usual wasting of muscle with age and retained skin fat layers that usually thin out later in life, causing wrinkling. Nevertheless, it became clear on the eve of my centenary that I would need extensive transplantations. My organs had started to show signs of senescence. They

would have lasted at least two decades more, but if we had decided to keep them, they would have gradually deteriorated and compromised my health as a whole. The next eight years were intense, debilitating, and painful. I moved from one transplant to another, interspersed with long therapy and recovery periods to regain physical strength. At the end, the doctors said I was as good as new, having replaced my two lungs, two kidneys, liver, thyroid gland, and pancreas. All these interventions had an impact on my fitness. I lost muscle tone and would never be the same again.

I divided my life into periods defined by the transplantations I had had. The *Prime* lasted the first century. *Second Life phase one* started with the first set of transplantations and lasted until I was 130 years old, when I had a major overhaul of my intestines. That was tough, the closest I came to dying during the project because of the generalized weakness it caused me for months. *Second Life phase two* lasted until I was 142 years old. By then, my bones started showing signs of senescence, more so those in the limbs, pelvis, and spine. I was terrified. I knew very well what it represented, but there was no way out. To accommodate the marrow, a mix of bone tissue and titanium foam would replace large bones, while smaller all-titanium bones would be used where possible. We—and especially I—hoped these newly-engineered bones would last two centuries or more.

The next fourteen years were the most painful and frustrating of my life. I spent more time in hospitals during this period than anywhere else. The transplantations were sequential and followed by intense physiotherapy to recover mobility and function of the affected parts. At the end, 73 percent of my skeleton mass was replaced, including my dental arches. I lived on soup far more than I would have liked, had to relearn to walk,

and resorted to wheelchairs far too much. My old daily routine was compromised, and it was then that I missed it the most. Besides, I was no youngster anymore. My body may have been immortal through the might of potent drugs, but it was frail. Immortality was proving hard to get.

Third Life extended until I was 163 years old. The stress I had been put through by the transplantations had exacted its toll. My heart and second-generation kidneys were weak and in need of replacement. For the next two years, I would be a hostage of hospitals again. It was the last straw. I was psychologically shaken. These would be my last transplantations, if I survived them. I could not stand it anymore.

By then, biologically active molecules and cell repair nanomachines had done a splendid regeneration job in my brain and nervous system, but even so, we were losing ground. My brain would not last forever, and that was it. No matter what we did, we could only extend life. Immortality in the human form was showing itself unattainable. The ultimate option stepped forward. The only way to make me immortal was to preserve my mind outside of my brain. It would have been laughable if it hadn't been a serious proposition. In our favor, I can say it did not last long.

Brains does not work by executing coded instructions, as does a computer, but through the exchange of chemical signals between neurons in connections called synapses, which form variable data transmission circuits in the central nervous system. Each synapse is equivalent to running a digital instruction. Because synapses are so minute and packed so closely together, it is hard to get a handle on the complex neuronal circuits that constitute what we call the mind. At best, combining high-resolution photography, specialized fluorescent molecules, and massive computing power, we could

capture this information and convert it into imagery, but in no way could we tell what information every single synapse was relaying.

The brain's overall complexity is almost unbelievable. Each synapse is more than a mere on/off switch. It acts like a microprocessor with both memory-storage and information-processing elements, containing a thousand molecular-scale switches within it. My brain, no bigger than a small cantaloupe, had something between one and five hundred trillion synapses, operated cold at ninety-nine degrees Fahrenheit, required no maintenance, had lasted more than a century and a half so far, and consumed less daily energy than a light bulb—an ultimate efficiency model with more switches than all the computers on Earth put together. If we managed to map and catalogue all my synapses, where else could we replicate them than into a copy of my own brain?

That was an important issue. The mind is what makes every person an individual—some would say, the scientific equivalent of the soul. Each brain has its unique set of synapses, its unique mind. I would not be me if we shuffled that. According to the optimists, if we managed to upload my mind to some post-human entity, I myself would be able to certify whether I was me in the other form, thus validating the migration. The point was that such migration would require a super computer beyond any other humanity had built before just to manage the upload to whatever recipient they were thinking about—which, by the way, we did not have. It was a groundless pipe dream.

I survived my heart transplant and received two new kidneys at 165 years old, thus beginning *Fourth Life*, which would be the last. Another psychological factor helped my decision: human relationships. I had lost my nuclear and extended families, along with my dear friends, far too long ago. I had also had a wonderful relationship with my

grandchildren, for I knew my memories would be the only thing I would carry with me. I missed them all—their laughing, the Christmas trees I had assembled for them, the cartoons they liked so much, the cakes and candies, and wiping up their messes too, emotions harvested from the foolish things. Above all, I missed the fear of losing them. I met interesting, intelligent people along my journey, inside and outside my project. I was a celebrity, after all, and people wanted to know me and talk to me. The nature of the bond was different, though. The seeds of genuine love and friendship were sowed early in life. It was hard to get them back later.

Twelve of my great-grandchildren were still alive, elderly persons who look older than I did. I had my third, fourth, and fifth great-grandchildren as well and went to family reunions whenever I could, though I felt like a stranger among them, a guest rather than the patriarch I was. They always treated me well, but I did not share their world and conviviality. Those who I considered my *real* family were lost in the night of time. How could one replace irreplaceable persons?

The heads of my project kept my decision to refuse further transplantations secret. They thought they could make up my mind in due time. There was no need to rush things, but other developments sealed the fate of our program once and for all. A debate had raged for a long time in the House of Representatives about whether or not the pursuit of longevity and the postponement of senescence were cost-effective healthcare goals given finite health care resources.

Hundreds of rich people and big wigs in non-democratic countries had tried to follow in my footsteps. Our data were public, and the teams those people put together to support their ambition used them extensively. We were forbidden to give direct support,

though, and watched these experiments from afar. The best result among them was 118 years old. Most of the teams called us for help in their moments of despair, but we could do nothing. Their subjects followed different care protocols, and none of them started as young as I had. Immortality was a commitment for life. One could not expect to run for it and continue living the life one had before. It was one or the other, a hard choice none of them seemed ready to make. They kept to their ways, and their results followed.

Surprisingly enough, the myth of the miracle elixir still held, nurtured by the quack promises of charlatans eager to try their unorthodox methods—and make a fortune on their way.

In fact, gene expression varied from one organism to another, and random fluctuations in the expression levels of many genes contributed in different ways to the decay process of each individual. The procedure I followed was tailored to my biology. The notion of a life-extension factor applicable interchangeably across our whole species presumed a linear response rarely seen in biology. Every wannabe immortal would have to have his personal solution, increasing costs exponentially. Besides, regardless of how much energy was devoted to repairing the body, random accidents and disease would exact their toll. Together, these factors lifted the life expectancy of those running for immortality by negligible margins.

My project had cost five hundred billion dollars since its implementation, for a single human life. As I said, it was a national effort—with doubtful results. Yes, I was the living proof we had prolonged human life indefinitely, but at what price? What for? We could not extend our method to the whole population, not even a handful of individuals, and we were not really talking about immortality anymore. We tried, we made history,

and we failed. Of course, some subsidiary technologies were developed, bringing health benefits for people at large but no dramatic increase in life expectancy. I was the sole beneficiary of a gigantic structure, having paid a high personal price, my skin a palimpsest full of scars, like a soldier returning from a vicious war. The time had come to end it.

As a renowned congressional representative had put it, “The quest for immortality was an expression of a childish and narcissistic wish incompatible with national aims. It would be unfeasible to distribute equitably among the population the advances in life extension the project has achieved, and it would be unaffordable even for a privileged few to enjoy without public funds.”

Continuing such pursuit at the expense of the people was purposeless. Ending it was the right thing to do. Therefore, in 2200, project Phoenix was terminated without clamor. It was 150 years old, another benchmark for our team. A scientific project had never run for so long in history. Things were changing, and other projects were following suit, especially the one on Mars, but this was another story.

At the end, we proved we were no gods. There would always be limits to our prowess. I agreed. Despite the astonishing success extending my life, our efforts were futile. Immortality was no longer feasible or desirable. On the contrary, life lost its magical touch and its savor, at least for a single traveler. My world was no more. I was a stranger in foreign lands.

We kept a small support structure to continue our studies and some of the research, but nothing comparable with what we had before. My last upgrades, plus all I had been through before, would buy me at least fifty years more. For the first time in my life, I had

become a simple mortal like anybody else—and had started to show the lined face common in human senescence. Congress’s resolution freed me. I was no longer a prisoner of eternity.

Ten years ago, the Extraterrestrial Lift and Logistics Consortium, XLCON, contacted me with a proposition. They wanted to promote the sesquicentenary of their first permanent base on Mars, Consortia, and wanted me as the longest-living person in the history of humankind to take part in it. A tricentenary meeting of the boldest scientific projects humanity had ever undertaken, as they put it. In return, they would open a line of credit to our research and support me with the medicines I still had to take. For someone who had never taken risks, never played contact sports, neither sailed nor flown for fun, the offer was thrilling—and very generous too. Consortia was the benchmark for space medicine, and I was more than happy to contribute to their history of success.

In 2212, my first sixth-great-grandchild was born, and I experienced the joy of being a grandfather again, sharing the role with her actual grandparents. I was grateful to them for letting me take an active part in such a special moment of our lives.

In 2218, I went to space, taking a hike in the cycler *Harmachis III*. Being the eldest human ever, I feel a bit like Horus myself—a suitable match. That is my story. Ingo Zimmermann, still breathing by the time of this account on my way to Mars. Out!

The end