The Martian Paper Flea

by Marilyn Dunstan

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Actuarial Speculative Fiction Story

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The Capricorn Research Labs Colony perched precariously on the side of Mars' Endurance Crater. Pilons dug 100 feet deep into Mars' red, rocky, windswept bedrock held the airy, futuristic, metal/glass structure wedded into the harsh, red craterside.

Capricorn's Airy Design had been the brainchild of the architectural designer Darwin Ayr, who had assumed a new name in honor of two Martian Craters. Darwin, whose architectural projects had embraced compelling design projects on Earth such as shopping malls and government office buildings had won the design competition for the Capricorn design site with his stunning new design. The concept embraced Mars as a living space, gave a suitable nod to the function of Martian research, and enticed the public with the promise of Mars's future to humanity.

Darwin Ayr had convinced an unwary public, struggling with the fumes of pulp and paper mills, smelters, automobile exhaust and the respiratory crush of ozone, that a life on Mars was not only a trip for adventurers and thrill seekers, but a place where the ordinary person could live a happy and fruitful life.

It took architecture to excite a depressed, Earthbound populace that a new existence on another planet was indeed possible with his design of the research labs and its surrounding living facilities in Endurance Crater. As Darwin Ayr took on a new name, he breathed a bit of life into folks that escape from Earth was possible, that it was possible to change the downward spiralling direction of this planet and populate another.

Darwin did not arrive at this newfound direction, alone, however. He would still have been toiling away, designing parking garages for strip malls and conference rooms for government buildings if he hadn't decided to travel to Chicago to trace his family history back to the crumbling brownstone apartment buildings of his grandparents youth. The same buildings that were up for historic preservation designation.

It was at an airport departure lounge where Darwin met Peter Gabriel, an actuary from World Actuarial Consulting. Peter was a young man nearing the end of his actuarial exams . Peter sat nervously, picking up magazines and putting them down again. One of them was an article on the the latest expedition to the Red Planet. He appeared to look through it casually and slowly put it down.

"Interesting article?" Darwin, then named Henry Barnes, asked.

"Uh...I guess so" Peter was noncommittal.

"Is Chicago your final destination?" Henry asked.

"Yes."

"Me too"

"Business?" Henry asked.

"It's November....I'm headed to an actuarial conference."

"Ah...seminars. There's that wind off the Lake to invigorate you, though."

They talked for some time, discussing football, genealogy, Peter's actuarial work and architecture.

"That article on Mars is interesting." Peter indicated towards the journal article.

"There's no air on the Red Planet!"

"There's a project in planning stages to develop a colony on Mars. It's sort of a back-up plan...for Earth," Peter demurred....

"Now that's interesting. A back-up plan?" Henry said

"Yes a backup plan. For the human race. If Earth goes to hell. They're setting up an experimental colony, going to do research. My boss told me about it. It came up in a staff meeting ..."

"That's interesting. Earth going to hell?"

"Volcanoes, earthquakes, hurricanes, floods, pollution. Bird flying into buildings. New and Old Testament stuff. Haven't you noticed?"

"Too busy with my design work."

"Well consider designing the new colony."

"Above my league."

"Give it a try. I have a pdf file about it somewhere. There's a prize for an architect that can design the most compelling design work for the research center and its surrounding living colony. Our firm will be one of a number that will bid on doing the actuarial work in conjunction with the research center. The chosen actuarial firm will team up with other scientific disciplines."

"I hadn't heard of this."

"It seems they want concept for the architecture. Something that will sell the public. These

things cost, you know."

Henry nodded. "I'd be interested in seeing the architectural proposal."

Peter gave Henry his card. "Send me an email and I'll send you that file."

"Thanks." Henry took the card and put it in his wallet. He was later to note when speaking in front of groups and in the preface to his book, "Designing Mars," that the definitive moment in his life came when he met Peter, cast hum drum design assignments aside and decided to apply his considerable knowledge of architecture, his imagination, and creativity to his contest proposal for a new living/research structure on Mars that would draw colonists to Mars.

When Peter's design was accepted for the new research/living facility he became an instant star. When it was designed and newly built he became a planetary hero of both Earth and Mars, a symbol of a brave new world, conquest, exploration and the research on Mars that was to save the planet Earth.

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It was a number of years later when Peter ran into Darwin Ayr at the teleport station on Earth-Central-Teleport Station in Atlanta. It was the first time they had met since their meeting years ago. Darwin, ruddy and alert, with a neatly trimmed beard stood reading his tablet. Peter sat in the waiting area, checking a Spreadsheet. Peter had sprouted a bit of a paunch from working after hours under deadline pressures as World Actuarial Consulting's project manager for the Mars Research Actuarial project.

They stood outside the teleport station, bustling with passengers bound for the fifteen minute trip to Mars. Most of the time was consumed with planetary customs and processing. Since the discovery of the red-orange magnetic rock Kirkaniumite on Mars, mankind had developed a way to teleport humans and equipment.

Kirkaniumite was a survivor of Mars's now departed magnetic field. It had thrust its way up to the surface, been weathered by the sands of time and had been subject to harsh solar radiation. The discovery of Kirkaniumite as an energy mediator and transducer had considerably shortened the development phase of the build for the research lab and the surrounding development.

"Hey, Darwin, how've you been? Thought your work on Mars was complete with the project all done," Peter called over Darwin.

"Oh, it's been very successful. Now we're starting a new phase over in the far end of the crater. It's an archeological center for recent finds. I like to imagine it as the next King Tut on Mars. What brings you to Mars?"

"I'm now heading up the actuarial team assessing morbidity and mortality impacts of life on Mars."

"That's important work. We designed the spaces specifically to the Planetary Institute's of Health's specifications."

"I know. You put in specially sealed doors, compartmentalized living quarters, segregated residential and work areas ..."

"We all looked at the same specifications from PIH. It was a major driver of our design. Minimal mixing of colonists between functional areas. Each area had its own oxygen supply system, backup and powers sources as well," Darwin said.

"It was interesting to read all this in the specs and we designed our actuarial research to encompass it. My superiors spent a lot of time putting their input into the research setting along with those at PIH." Peter said, "They were concerned about containment, among other things."

"So now you're here."

"Yes. It's my latest assignment. They wanted me to lose more weight before I went to Mars, though." Peter tapped his paunch.

"You'll get it there. The food is crap." Darwin paused. "I didn't design the food, just the spaces."

"I'll be working all the time anyway. I won't have time to eat. Besides I brought these." Peter pointed to a chocolate bar inside his shirt.

"Be careful, those melt in the transporter ... Just kidding."

"Not funny," Peter looked forlornly at the chocolate bar. "I need this for energy. I hope I can buy more there."

"No problem. You'll need all the energy you can spare to study the health impacts of our oxygen problem."

"So they're shared all the details with you," Peter said.

"The architect needs to know to design the spaces. Including the separate spaces for the colony groups," Darwin replied.

"It's serious. Earth is losing its oxygen supply?" Peter asked.

"Some people don't think so...it's on the news, but that doesn't really sell the issue that it's a problem....I mean it's supposed to happen over 1,000 years or so....who gives damn about 1,000 years? Live for tomorrow and all that," Darwin said.

"You bet it's a problem. The Earth's magnetic field is decreasing, has been for quite some time. It might disappear altogether. It might decrease and flip polarities. It might decrease and have

anomalies with variations in intensity or partially flip. There are all sorts of scenarios, and some of them involve losing our atmosphere completely." Peter, stopped, out of breath.

"Apocalyptic! Revelations on Mars! Oh, that's what some are saying! It's a wonder we even got funding for this huge venture. Folks are saying we're alarmists and that are scientists have gone around the bend. Myself, I'm scared...we're talking about a planetary time bomb!" Darwin looked around to see if anyone was listening.

"There's historical precedence for these events. Remember, Mars lost its atmosphere in the past. These events could happen again. History somehow gave us the blessing of Kirkaniumite, which has given us the gift of teleportation so we have an opportunity to meet the challenge." Peter emphasized. He knew Darwin had taken heat from those outside the scientific movement.

As if mind reading, Darwin said, "Yes these planetary disasters could happen, I'll grant you that, but there are those who think the chance of them happening is minute. These are some of the folks I have to deal with."

"It's all in the balance of risk," Peter stated. "It can be a small, even minute risk but if the dimension of loss is huge then it is worth paying the price to deal with this low probability, high impact loss. We've got their attention already with the Mars project underway. We need to whet their appetite, further to expand our efforts."

Darwin looked away towards the boarding sign. "We're ready to go."

Peter felt reassured. He had managed to mostly dodge the details of the compartmentalized living quarters which were to be used for research purposes. The oxygen experiments on Mars were to parallel the oxygen experiments going on at Earth, in high altitude climates and in artificially created environments. By titrating the atmosphere supplied on Mars, the experimenters hoped to determine how man could adapt to lower oxygen on both Mars and Earth.

Colonists to Mars were assigned randomly, depending with their occupational specialty and other groups to the pods. Colonists were told that the groups were being segregated for psychological reasons of social cohesion and group dynamics, and that they were being studied for how well their groups were performed under the strict Mars conditions. They were told that they were in a grand competition and that prizes would be awarded monthly to the group that had the best result within their unit operating area.

What they weren't told was that the oxygen levels differed between groups and that they were part of a grand evolutionary experiment impacting both Earth and Mars. That this would help adapt to life on Mars and help attenuate the problem problems caused on Earth by a decreasing magnetic field and oxygen environment. Peter thought about the grand responsiblity that had been put on his shoulders and those of the groups of scientists from the Planetary Institute of

Health (PIH) to conduct these ground breaking experiments.

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What they hadn't counted on, however, was the find of a lifetime, of a century, an eon. It came as a surprise, a dusty box, with the red Martian dust flaking out of it as the tall, gruff, excavator lifted it, along with an assortment of rocks, out of the Martian hillside. It was a strongbox, made of a glistening grey-black metal, speckled with a glitter that looked like quartz, but was rough, and scratchy. The archaelogist, a man named Herb, pried open the box and found scrolls, aged to a red hue from the insistent Martian dust which encircled it and black faced notebooks with lined pages.

Herb found hieroglyphics written on the pages, and a strange scrawling script in the lines underneath, like a human might write symbols and elaborate on them below. Perhaps it was a shorthand, Herb thought. Herb looked through them and bundled them up for his supervisors to study back at the base. By the time he had gotten back, his hand had puckered into a mottled assortment of raised bumps. It was at this point that the Martian paper flea was discovered. It was later examined and categorized under the electron microscope and found to like the Martian paper scrolls, but not the notebooks.

This fact had become known rapidly as the first explorers who had found the Martian paper flea had become infected by a virus that it harbored. Not having been able to actually see the Martian paper flea, but only see the rash that it left behind, the archeological explorers had come back from their discovery of the intelligent remains of a preexisting Martian society harboring the happy infestation of a viral element long since forgotten in the sands of time, and of Mars, for that matter.

The researchers soon discovered the viral element underlying the rash produced by the Martian paper flea, one that bore some similarities to human viruses, while retaining some pertinent distinctions. This discovery, made under the electron microscopes of the common laboratory of the Colony, opened the eyes of scientists to a wide range of possibilities.

For while the living compartments were segregated for some, one common laboratory served many of the scientists themselves, who were served by a crew of common outdoor workers, machine and equipment maintenance crew, etc. The virus quickly spread throughout the complex and was found to be transmitted from person to person by contact and breathing the aerosolized pores that were shed by the virus.

Peter found Dr Gregor Mandalay, the Base's principal Scientist in charge, in his lab in Sector One. Gregor was a man in his late forties, an expert in molecular biology and astrophysics. He had a crew of a couple dozen men and women of varying specialties that were involved in principal research on Mars. In addition there was a healthy complement of medical doctors working in the Colony clinics that supported the research effort and kept the population healthy.

"You asked to see me?" Peter nodded to Gregor.

"Yes, really. We need your help with analyzing the spread of Oxytroph." Gregor said.

"Oxytroph?"

"Yes. I've just named the Martian paper flea's virus 'Oxytroph.'"

"Now? At this phase?"

"You just got recruited. We're researching the pathophysiology of Oxytroph, what systems it is impacting." Gregor looked up at the clock. "We need to track its spread, morbidity, mortality through the Colony. The clock is ticking."

"Okay."

"We'll need to work on parameters for transmissibility, periods where the host is asymptomatic but can spread the virus, the reproduction number r0. I'll give you data and you can set up a model."

"You send me the data. I'll get a spreadsheet started. "

"We already have some knowledge of the timeframe for the development of the rash" Gregor said. "However the rash is not always apparent in cases uniformly after exposure.

"Do we know if the individuals exposed who haven't developed the rash are actually infected but asymptomatic or whether they been exposed and not contracted the virus?" Peter asked.

"We're still trying to figure that out," Gregor retorted.

Peter turned on his heels and walked out. He felt wanted, and that was a good thing. Still, he was worried. He had a feeling that this virus was just beginning to exert itself on the Martian Colony's human population.

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Some individuals simply got a minor rash, which the immune system fought off vigorously. Some got seriously ill, with others dying. Peter continued to work the data and track the spread of the virus throughout the population, massaging the parameters of his viral model as the experience evolved. He was unnerved, when shortly into the virus's run through the population, the first colonist died. More were to follow.

In what was to be later called a plague culling, the virus caused many fatalities throughout the Colony, eventually resulting in the colonization of the virus Oxytroph in the survivors in the form of an endogenous retrovirus. The endogenous virus Oxytroph was now sustained in the human population.

It took a full year for the linguists to decipher the Martian ciphers. What the scientists had found was that the Martians had found a way to deal with the planetary challenges of a dying atmosphere and a lessening magnetic field.

The Martian's solution had been found inside the microscopic Martian paper flea. The Martian paper flea bred in paper scrolls, laying round orange corpuscular eggs which grew rapidly in the anoxic environment, developing a hard chitinous shell which glowed faintly green in the dark. The young Martian paper flea used its sabre like teeth and unicorn shaped proboscus to work its way out of its chitinous shell, eating it and leaving a acidic, slimy residue behind.

So far the Martian paper flea, which harbored the Oxytroph virus had been found to be the only source of life remaining on Mars. The Colonists marveled how the Martian paper flea could survive so readily, in fact marveled that any life whatsoever had been found.

The archaeological dig had uncovered the equivalent of one of Earth's Biosafety Laboratories, long since deserted. Archaeologists poured over the paperwork that Martians had left behind. There was sufficient evidence to determine that the Martian paper flea had been used in biological experiments by Martians to enable them to counter the declining oxygen environment as the Red Planet lost its atmosphere.

The most interesting part was that those who recovered from the exogenous Oxytroph virus, developed antibodies, and endogenized the Oxytroph virus developed marked improvement and efficiency in their respiratory function.

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Peter had been through a lot over the months, charting the course of Oxytroph as it infected the human colonists on Mars. Oxytroph presented his mortality and morbidity studies with a huge outlier versus usual human experience on Earth. This problem presented him with difficulties in assessing the marginal effects of the move to Mars. In addition, their careful plans about testing differing oxygen levels between containment areas had been disturbed by the spread of the virus between those areas.

Now he was struggling with the ethical dilemma that was Oxytroph. It had significant mortality experience as well as morbidity decrements that placed a strain on the Colony's medical clinics. However, it was apparent that for those that survived, there were improvements.

Peter was sitting, relaxing in the lounge, thinking over these issues as Gregor came in.

"It's amazing how something so destructive can prove so beneficial once sustained in the population," Peter said.

"The endogenization occurred much too quickly," Gregor countered.

"It seems to be having a positive impact on respiration," Peter said. "Health has improved in the

survivor population."

"I'm still concerned. You can't get something for nothing," Gregor said. "Entropy is a universal law of nature."

"So did it do all its damage initially? Is there more to come? Are there further downside to Oxytroph?" Peter asked.

"We don't know yet. All we know now is that those exposed who have developed antibodies and endogenized Oxytroph have had a marked increase in their respiratory capacity; their demand for oxygen has decreased," Gregor remarked.

"What is that due to? Have you figured that out?"

"We're doing tests. Blood tests, exercise tolerance tests, everything we can think of. "

"Where does the improvement show up? How will I be seeing it in my morbidity and mortality studies?" Peter thought of all the work he would have to do over.

"In the oxygen saturations." Gregor looked down at the sheaf of papers he was holding. "Patients are able to maintain improved exercise tolerance capacities."

Peter stared at him. "Really?"

"Does it impact the mitochondria?" Peter asked "That is a vital energy producer within the cell."

"Yes it does," Gregor added. "The mitochondria provides energy production of ATP through what is called oxidative phosphorylation or OXHPOS. Oxytroph improves the functioning of the mitochondria."

"That's good."

"And there's more," Gregor said

"What's that?"

"It improves anaerobic respiration, glycolysis, as well. Also, it attenuates the creation of reactive species as the body shifts between aerobic and anaerobic respiration."

"Sounds like a winner. That should help the metabolic syndrome, correct?" Peter asked.

"Yes, and a lot more," Gregor said.

"Guess that means charging more for annuities," Peter said.

"Annuities are your problem. Actually, our problem is that we think Oxytroph's too good to be true, that we are missing some side effect."

"Can't you dial it back if you need to?" Peter asked. He contemplated adverse side effects it might have, his imagination running wild.

"Worried?" Gregor looked over at Peter's furled brow. "I can tell when your actuarial wheels are spinning."

"Sure I'm worried."

"With good cause." Gregor pulled out his tablet and showed Peter some tables. "Oxytroph is mostly sustained in the human population here on the Colony. Existing within the human population inside its host. At least remaining."

"We can't get rid of it?"

"No!" Gregor was adamant.

Peter had already put hours into his spreadsheet. First the negative impact of the virus, now its positive effects. His spreadsheet seemed like it was mirroring some of the tests in the New York 7 with its sharp downs and ups. He knew he'd have to rework his model.

"Yes. You have to redo your model. We have determined that an endogenous retrovirus is at work, retooling our system to adapt to increasing hypoxia.

It wasn't two weeks later that the nuclear DNA and mitochondial DNA (mtDNA) of the entire colony population was sequenced. Gregor and his team had found the location of the endogenous retrovirus and had been able to identify those in the Colony who had been exposed.

It was left to Peter to use the new data as an additional variable to track the morbidity and mortality results of the Colonists. He was able to determine what types of medical conditions were correlated with being colonized by the virus. He then used that data to try to predict any subsequent spread. For it turned out that a remnant of the population remained uncolonized by Oxytroph.

"My models show that all of the colonists have been exposed?" Peter asked Gregor.

"Yes. That's true. They all have antibodies with varying response," Gregor responded.

"But the virus has not endogenized in all." Peter was concerned. "How do you account for that? How can I reflect that in my model? I can't predict the morbidity and mortality results for those folks. Is there some kind of time lag?"

"Oxytroph has not endogenized in some because some already existing endogenous retroviruses do not allow them to accept Oxytroph."

"But Oxytroph did not kill them," Peter protested.

"It is the Goldilocks effect, too much difference to endogenize, too little difference to cause a life threatening reaction," Gregor retorted. "Yet some, as you know, have died as a result."

"Are you still worried about any negative effects from Oxytroph?" Peter asked. His improvements in morbidity and mortality looked too good to be true.

"I always worry. We're dealing with an alien virus." Gregor folded his hands and looked down at his feet.

Shirley walked into the room. Shirley was a PhD archaeologist and linguist dealing with ancient languages. Nothing, including studies with Sanskrit, Egyptian Hieroglyphics or Sumerian had prepared her for the discoveries made on Mars. She had asked Peter for help in developing a mortality study for the ancient Martians shortly after his arrival. He had put her off for some time, and finally found the time to lend her some help in between his time with the colonist health data.

"Aliens? My favorite subject," Shirley retorted. "What's the problem?"

"We're talking about possible side effects of Oxytroph," Gregor countered.

"Worry. Worry. Don't look a gift-horse in the mouth," Shirley said. "Martians developed Oxytroph and used the Martian paper flea as its host to improve respiration. That much is well chronicled in the Martian documents that I and my team have recovered."

"And how is it chronicled?" Darwin Ayr came into the room. He had been left out of most of the scientific conversation.

Shirley looked at Darwin as if she half expected him to redesign the lounge where they were while they were talking. "I'm not sure you know the whole story."

"I don't. Please let me know." Darwin shot a look at the others, expecting disapproval for wasting their time. Instead they shot back a look of wary patience, interested in finding out but too afraid to ask, themselves.

Shirley loved to talk. "The Martian scrolls document the decline of the Martian atmosphere and its magnetic field in exquisite detail. They took readings, they developed biochemical engineering techniques. They did experiments on their fellow Martians with genetically engineered material. There are records of horrible failures, of grotesque mutations from experiments with their citizens in order to counteract the decline in their atmosphere. There is also the record of their development of Oxytroph. In the rapidly declining oxygen environment they distilled the essence from the hard unicorn beak of the Martian Paper Flea, they genetically engineered it with Martian DNA, reinserted it back into the Martian paper flea as a virus and then used the Martian paper flea as a vector to spread."

"Why did they die out, then?" Darwin asked.

Gregor and Peter looked at each other. Trust Darwin to ask the question that neither of them could bring themselves to ask.

"We haven't been able to locate yet the later chronicled history. We do have the records of their happy successes in the near term after developing Oxytroph," Shirley noted.

"I hope you're still digging?"Peter asked, thinking of his mortality studies.

"Oh yes, we're out in Sector C tomorrow starting on a new find," Shirley responded.

Shirley bundled up her scrolls and departed. Still, Peter was concerned that there was some effect from Oxytroph that lay dormant and could arise later, causing an increase in mortality and morbidity. It all seemed too good to be true. The question was what would happen 5, 10, 20 years down the road?

Oxytroph was a material that could boost their energy use and keep them from having to spend hours and hours excavating water and thus oxygen from the Martian subterranean realms. It was needed for their life on Mars and also to help those on Earth deal with decreased oxygen levels and a declining magnetic field.

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Peter continued to study the evolving health data, and was encouraged by the results he was seeing. Of course those colonists fortunate enough to have been selected had to be healthy to come to Mars. So he was dealing with a select group to begin with, one that was off the charts when it came to health.

His thoughts turned to possible decrements from the endogenization of the Oxytroph virus. He knew, from evolutionary principles, that for Oxytroph to be successful in the evolutionary sense, it would need to keep its host healthy up through the host's reproductive years. After that, morbidity decrements could increase without harming its ability for reproductive success. Peter hoped it could do so with a decent level of morbidity compression, at least.

While employed on Earth, he had spent a considerable amount of time studying mortality and morbidity compression and how it impacted the cost of patient care. Improving the lives of patients, and at lower costs, so that they remained healthy into the later years was one of the major focuses of his research. However these issues evolved over years, in evolutionary time. They were dealing with a Martian engineered virus that worked in a much shorter time frame.

The clue came later, as evidence from colonist births began to emerge. There were abnormalities in the formation of fetuses.

When the reproductive cycles of the female colonists began to synch up and produce a statistically greater yield of pregnancies than expected, it attracted the attention of the watchful scientists and doctors. Those pregnancies were followed with great interest mixed in with a

considerable dose of anticipation.

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Peter stood outside the door of the clinic, watching the women queuing up for their late pregnancy checkups. There were so many of them, babies all due within a short window of each other. Peter wondered if the doctors would be able to handle them all if they all presented at once.

Darwin stopped. "I didn't plan for all these pregnancies in the Colony design. What am I going to do?"

"You didn't plan for babies?"

"Well, some. You know, these scientists, most of them, they're concentrating on their work."

"It seems their minds are elsewhere, eh?"

"We need more cribs." Darwin turned around and left.

Gregor came by. He looked preoccupied as he stood gazing off into the clinic.

"How's the analysis coming?" Peter asked. He was worried.

"We're sure it's Oxytroph causing the problem. It's an endogenous virus, you know. It's more or less become sustained in the human with beneficial results as you know. However, it's interacting with other endogenous viruses, ones that govern the viability of the placenta, its attachment," Gregor said.

"Oh, no!" Peter looked up towards the ceiling, hopefully. "I hope this isn't an all-pervasive problem?"

"This doesn't affect everybody. We're trying to narrow down who is affected and who isn't, and precisely why." Gregor paused.

"The babies that make it. Are they ..."

"We think so." Gregor turned and walked away.

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The scientists were focusing on the endogenized Oxytroph and its relationship with other endogenous viruses in the system. They were also focusing on the role the endogenous virus played in aiding the interoperability of the mitochondrial DNA and the nuclear DNA as well as glycolysis. They confirmed that the Oxytroph interfered with the placenta in some patients with certain characteristics. If the placenta was not allowed to form properly, the fetus could not go to term.

As the scientists studied the archaeological history and pathophysiology of Oxytroph they concluded that it pointed towards the establishment of a haploid race.

Peter had never encountered a problem like this in the annals of Actuarial Science. How do you account for the emergence of a new human being and how do you develop mortality tables and experience for them? Were they that much different than humans or were they human at all? Were they, in fact a new species? Could they procreate? Importantly, there were concerns regarding the potential spread of Oxytroph to Earth.

The scientific staff on the Mars Colony rolled up their sleeves and studied the implications of the emergence of a new type of human being, one that had been engineered through a viral strain found in the Martian paper flea vector. The benefits of Oxytroph appeared to be great but the risks were in dangers yet to be discovered, as well as in the risk Oxytroph would spread throughout the Earth population. There was the great unknown of the potential development of a haploid race, resulting from the introduction of Oxytroph.

In the end, they decided that time was on their side, and they settled in with their lab coats and spreadsheets to a 100 year isolated clinical trial on Mars. After all, they had 900 years out of a thousand left ... If the thousand year clock for the loss of Earth's magnetic field was to be believed.