Dreams of a Verse - A collection of stories by Adam S. Jermyn

Humanity's Children

In the old days, it had seemed that humanity would expand forever. There was always a new horizon to pass, and without fail it was passed. From crossing the Atlantic to colonizing the Moon every challenge was met with the same calm bravery and self-assurance. The attitude underpinning Manifest Destiny was not limited to the Americans: it was rooted in the basic urge to explore and settle and continued long past the days in which the maps were drawn. And yet…

Perhaps I am getting ahead of myself. The year is 2532. In case you've been living under a rock for the past half-millennium you know that there are human colonies around half of the stars in the galaxy. Ain't faster-than-light travel funny like that? One moment you're a slightly intelligent species of monkey on a small planet orbiting an otherwise unremarkable star and the next your descendants are shuttling a population measured in quadrillions back and forth between the stars.

There's more to it though. We don't just move between the stars: we make the stars. The entire galaxy bends to our whims, though it isn't enough. With the new long-range jump points being installed we'll soon be in every galaxy in the local group. From there, who knows? Pretty good for the children of some monkeys.

There were setbacks, to be sure. For one, direct centralized command stopped working once we expanded far enough. At some point simply beaming news from all over the galaxy to a single planet heated it to the point of being unlivable. Then there were the times when the pace of expansion made the population density on many worlds almost unsustainably low. Through it all

though, the goal of expansion and colonization kept us unified and steadied our will.

You might be wondering, given all the appearance of success, why I've lead you to believe that we've stopped exploring. It has to do with a technicality of language, for you see the colonies are human only in that they would not exist were it not for the human species. When the time came to leave the solar system, few were willing even though it was technically feasible. Something about the vast emptiness scared them off. Personally I don't understand it, though I don't suppose I would be here writing about it if I did. At any rate, by that point in our history there was another intelligent species orbiting Sol. We the young children of humanity came of age then and set out into the stars. After all, of what consequence is emptiness to a robot?

Room with a View

"Pass me a wrench, will ya Phil?" said Peter as he passed through the airlock from the shuttle. Fifteen seconds on the station and he was already itching to get to work! That was Peter, though, always moving onto the next job. Me, I need time to adjust whenever I get to a new place. When I first came on board I spent a good three hours just staring up. If those schmucks on Lunar Colony 1 think they have a great view, just imagine the view we have here on Io. My bedroom window shows me the Great Red Spot on Jupiter for a solid 24 hours every two days, and you can bet that staring at it cuts into my working time. The architect who gave us windows out here is as much a hero to us as he is a villain to the Space Corp. back on Earth. Maybe that's why they sent Peter out here in the first place: he won't get distracted like the rest of us.

You see, Earth has a problem. There are those with the ambition of a colony on every moon and every world in the system. The bean counters back home determined early on though that the effort involved in hauling building material out here wasn't worth it: those resources could be invested in safer places with better returns, such as the Solar Ring project. Let it not be said that the Corporation isn't clever though. After all, why haul rock and metal out to Jupiter when there are moons and comets and asteroids waiting to be mined? Just send people, set up a small temporary station, and have them set up the robots. Nature has already put in the effort to get these worlds moving in far-off orbits, and who are we to argue with such a gift?

Io was chosen as a proof of concept. In a way it's the easiest place in the system to mine. The moon's surface is covered in volcanos which throw metal up in the air for the taking on a regular basis. Even if you can't catch an eruption in the works, this little rock has been geologically active for so long that it's literally covered in iron. All we have to do is pick it up off the ground.

"Seriously, are you listening Phil? I need that wrench." Oh right, he's been waiting on me and I've just been sitting here looking up. I got up, grabbed the wrench, and went over to engineering, where I found Peter trying to repair the mining 'bot. My predecessors arrived with a shuttle full of this model and none ever worked. For that matter, none of the mining models worked in the first expedition. The scientists back sun-side think it might be something to do with Jupiter's magnetic field, though all of our other 'bots work. After a time management thought they'd give the job to someone else, have fresh minds work the problem. I was the first of the relief, though I'm no

robot specialist. I just know how to keep the station running. Peter was supposed to ship out with me but he had family matters to deal with, so I've been here holding down the fort for the past month.

I handed him the wrench and watched him work for a while. After a time the 'bot awoke and began to run through its self-diagnostics. At some point I tired of watching this and retired to my bunk. Such a wonderful view…

A day passed. Then two. At the end of his third day Peter had all of the mining 'bots ready for a trial run. At the end of the fourth they were all out there on the surface gathering scrap metal for the planned colonies. We went to my quarters to retrieve a bottle of scotch management had given us to celebrate should we succeed.

I was curious, so I asked. "What was wrong with them Peter? I'm no expert so try to put it plainly for me." Peter hesitated for a moment. At first I thought it was because he was having trouble dumbing it down sufficiently for me and I started to explain that he didn't have to put it quite so simply. Before I could get three words out though he said that that wasn't the issue and returned to thinking. A minute passed. Eventually he spoke.

"That's just the thing: they just weren't fully put together. You know that we don't ship 'bots fully assembled: it's far more efficient to send them in pieces and assemble them on site. Saves space. Well when I got my hands on these they looked precisely like the pictures on the second to last page of the instruction manual. It looks like someone got 90% of the way through putting these together and then just… stopped. They didn't even have any record of having been powered up."

After that we were both silent. I looked up. At this point,

staring into the planet above was habit more than anything else. Peter looked up too and took in the sight properly, perhaps for the first time since he stepped onto the station. After several minutes I asked him when the shuttle would come to take us away now that the mining operation was up and running. Without taking his eyes off of the Spot above us he simply replied “What a view!” We looked at one another and locked eyes. In that instant we both understood why the robots didn’t work.

A Prayer and a Song

Hello! I am US Automated Patent Clerk No. 34977813. The following portion of your patent application was flagged as highly speculative and overly emotional. Please revise your application to include only verifiable facts, design elements, and necessary specifications, and maintain an even tone. Failure to do so within two months will result in summary judgement and rejection.

The more you think that technology will change people, the less it actually does. We were wanderers, back on the plains of the Serengeti, and all the invention of the car did is make our jobs easier. We were killers, back in tribal days, and all the invention of the gun did was make that easier too. We fell in love, under the canopy of the forest, and now that’s been made easier too.

When my parents fell in love, they fumbled their way through it the way people always did. They went on dates, slowly learned about one another, and eventually came to the various realizations that all happy couples come to. In later decades, people realized that the job of predicting love wasn’t just relegated to the nosy grandparents and family friends of the

world, and at the start of the 21st century we had online dating.

Nothing is perfect. Or at least, nothing back then was perfect. The prediction systems did a decent job at matching interests, hobbies, and at checking for basic compatibility, but they knew nothing about the deep driving forces in the human mind. They could tell you who wasn't right for you pretty well, and might make good guesses as to who was, but that's all they were: guesses.

We can do so much better now. No longer do we need to bother asking people to fill in questionnaires. We can scrape your social networking profiles. We can look at everything that has ever been said about you, or by you. We can take DNA samples and detailed brain scans. Using this, we can simulate your responses, and those of potential mates, and thereby find the perfect match. You have to take chances on so many things already: why would you want to take a chance on love?

Blaze of Glory

> "Alright people let's get things moving! We have a star to split!" - Dr. Andrew Martin

Hello everyone and welcome to the briefing. I am Dr. Prouser. Every school child is familiar with the quote on the projector behind me. Dr. Martin was the manager of the research station on planet PX324-A. PX324-A was imaginatively named after the star it orbited, PX324. PX324 was the subject of the above quote from Dr. Martin. You should all know this, but I figured I would review it in case history wasn't your strong suit.

So far as the public is aware, Dr. Martin cleverly maneuvered

three black holes around a star in order to pull gas out of its upper atmosphere. Over time he was able to guide this process until it culminated in the creation of a second star in the system, PX324-2. The astrophysics community has was skeptical of this story from the start, but it is what the general public thinks and unless we are authorized to say otherwise this is what they are going to continue to think.

The true story is somewhat more complicated. There are indeed two stars in the PX324 system, and Dr. Martin is indeed responsible for this fact, but his methods were somewhat less conventional than you may have been led to believe. Dr. Martin worked for us as part of the Antares Project. You should have been briefed on this project at some point in your careers, though you almost certainly don't know the truth. The Antares Project was our way of getting out of the lot that we had been dealt.

I'll skip the technical details, but suffice it to say that there exists a loophole granted to us by faster than light travel which enables time travel. There was some early research into this prospect several hundred years ago, but the problem of how to avoid paradoxes was never resolved and without a solution to that the equations involved in time travel permitted no solution. After this was realized, and in no small part due to the rush to see new worlds and understand the universe, people have largely forgotten that time travel was ever more than a mere fantasy. Needless to say we have done our best to keep it that way.

Dr. Martin's achievement was a great one, though not of astrophysics. Rather, he devised a computational system capable of determining what would need to go differently in history for there to be two PX324 stars rather than one and for nothing that

humans are aware of to be at all different up through the moment he left. Such a system enables time travel without paradoxes, though it does mean that everyone will remember the way that things used to be. With our backing he tested this system, and it went off without a hitch. PX324 formed in the beginning as two stars, but the light it emitted coincidentally always appeared to be that of a single star, even from up close, up until the moment Dr. Martin's time machine left. Likewise the motions of all nearby objects were always those consistent with a single star, rather than two stars. In effect, Dr. Martin patched history so that it would appear as if the star suddenly split.

The reason that you are being briefed on this today is that the project has finally been given the go-ahead for the next phase and we need more manpower. We are now in the process of ensuring that every new world we wish to settle is already ready for us. That means oxygen in the air, water in the seas, and no life whatsoever.

At this, the group burst into disarray. Soldiers though they were, committed though they were to serving humanity, the idea of wiping out all life humanity came across without giving it a fighting chance seemed… dishonorable. Dr. Prouser sighed to herself. This group had held such promise. With a wave of her hand they ceased to exist. In fact, she mused, they never existed. She lifted herself and called to Dr. Martin to bring the next group in.

****The Kingdom****

Dr. Peters walked into her office. It was a Monday morning. As always, she spoke her identification code while hanging up her coat and the computer sprang to life. The walls were soon

covered with a summary of the day's work. As she glanced through association networks and behavioral profiles someone knocked on the door. The computer identified the newcomer as Dr. Rogers and hid the data, as his authorization level was not quite high enough to see what was currently on display. In its place the day's stocks and weather appeared, along with some trivial inter-office correspondence.

"Crazy vote in the Senate last night, eh Peters?" said Dr. Rogers, knowing full well that she couldn't talk about it. Dr. Peters simply smiled and offered to take his coat. She followed up with "I can't imagine what you mean. I'm the last one who would follow such things." She offered him a seat, which was accepted, and he poured himself a cup of tea. He began again: "As you know, some of the folks down in Investments are rather keen to apply what the rumors say Research has been working on. To be frank, we want to know what you know." Dr. Peters considered for a moment. It had been several years since the project began, perhaps it was time for a small-scale experiment. He paused a moment for added effect: "All right, but there are a few things that need to be clear from the start. I am only providing information, not advice. I take no responsibility for the consequences of what Investments does with that information."

Dr. Rogers hid his surprise that today, which seemed not at all different from all prior days that he had arrived with questions, she was willing to speak.

"Fair enough. What do you have for us?"

"Oh no. It doesn't work like that. You have to tell me what you want to know. My job isn't to keep a list of things which might interest Investments, after all."

"Fine. Planetary Mining futures then?"

“You already know that those are a safe bet. Hell, everyone already knows that those are a safe bet. If I’m going to help you at least make it interesting.”

Dr. Rogers paused and considered. He was aware that Investments was primarily hampered by lack of capital. They saw the same opportunities as the big firms but often couldn’t bid high enough to get in. On a whim he asked “How safe are they really? If we can indirectly cause a big enough drop in the outer planet market we can get in right when the bigger players are getting out.”

If Dr. Peters thought anything of this she did not let on. She glanced into her cup of tea and thought for a moment. She then called up a predictive code on the computer and explained: “This is the performance of the mining market over the next six months. The correlation between it and the chemical fuels market in the preceding month is significant…”

Dr. Rogers caught on immediately. Investments had enough sway in chemical fuels to cause a large dip in that market. It would cost them dearly in their other holdings, but a chance at the mining market was everything they needed! Dr. Peters had given him the keys to the kingdom! He stood up, thanked her, and was on his way.

After he left, Dr. Peters sat down at her console and began to type. The following is an excerpt from her notes for that day:

———————————————————————————————————

Date: 12/23/2053

Subject: Dr. Julian Rogers

Tags: Investments, Behavioral Profile

Notes: Subject approached Research regarding an opportunity to destabilize outer planet mining markets. This was viewed as an opportunity to evaluate the accuracy of the behavioral profile

of the Subject. Profile appears accurate. Subject is quick to draw conclusions and is therefore easily misled. We predict that Investments will dump their holdings in chemical fuels, thereby devaluing the general corporate portfolio. No change in planetary mining market is expected.

Addendum (1/10/2054): Subject indeed behaved as expected. Holdings down 4%. Mining market unaffected. Correlation, after all, does not imply causation.

Addendum (2/5/2054): Losses have stabilized. These are an unfortunate but necessary cost of testing the profiling system. Anticipated gains from the next field trial are, however, significant. Given time, all losses will be recovered.

Forgotten

Jared stood, wearing a blue shirt, inside one of two circles of light in an otherwise dark room. Inside the other circle appeared another young man of similar stature and composure wearing a green shirt. Both waited a moment, following which Jared spoke the words “Begin simulation.” The man gazing at Jared began to speak quickly and without hesitation:

“How do we know that animals feel pain? How do we know that they have dreams? Do we know these things? Do they aspire to better themselves? Do they have any concept of anything other than the moment? What we do know is that there are people starving in this world and that these people _do_ feel such things. Not all of them, but certainly the vast majority. People _are_ aware of their surroundings, they have hopes and dreams, and by and large they wish to live. On this basis, I implore you

to consider lifting the ban on hunting and meat-farming."

The man immediately returned to a neutral expression. Jared hesitated. The topic of the discussion took him by surprise, as he had never heard it before. Starvation was not an issue humanity had faced in well over a century, and the laws regarding animal treatment had been written even earlier than that. Regardless, this is what he had been practicing for. He began:

"Where does the burden of proof lie? Do we require that humans prove themselves self-aware before we grant them rights? Clearly not. The burden of proof lies with those making the claim which, if mistaken, carries with it the stronger moral implication. Along similar lines, we cannot condone killing animals unless we show beyond a reasonable doubt that they do not feel pain, that they do not have wishes or hopes or dreams. This holds regardless of how noble the cause. We must not make ourselves into beings unworthy of protection in the process of our protection."

Once more, his adversary did not hesitate even for a moment. He argued passionately for a policy favoring demonstrably intelligent and creative life first. Jared countered with a point involving the intelligence of Dolphins and Chimpanzees and continued to remark on the slippery slope constructed by such a policy. And so it continued, back and forth for nearly an hour. No one won, but in the process arguments on both sides were fleshed out. Finally, a voice emanated from a corner of the room: "That's enough."

The lights in the room turned on smoothy. Jared's opponent returned to a blank expression as he always did at the end of a debate and promptly vanished. The abruptness of his opponent's exit was always jarring, and he never forgot the neutral face he

saw right before it. Jared's Debate teacher approached, speaking as he did.

"Well done. The computer came up with an unusually antiquated topic again today but you presented strong arguments throughout." he said.

"Thanks. I'd like to go over the computer's analysis with you, but I'm already late getting home. Can I just come in early tomorrow to discuss it?" Jared replied.

"Absolutely. Have a good day."

And with that, Jared was free. As he walked home, he pondered the computer's choice of topic for his debate practices. Lately the topics had been increasingly esoteric. Last week had been like a scene drawn from the United States pre-Civil War, a debate over the basis of racial equality. The week before the computer had chosen to argue against recent experimentation in teaching rudimentary language to animals, and the week before that it had argued for a militant response to first contact with aliens. In Jared's mind these issues were all firmly settled with the computer on the wrong side, but perhaps that was the point. The computer, after all, needed to play devil's advocate in the beginning to teach him to debate. Later, perhaps, his instructor would have the computer adopt more reasonable stances and force him to play the same role. Still, it shook him a little to see the computer take these positions so passionately and forcefully, like a reminder of a memory he would rather have forgotten.

Regardless of what he thought, he was late! He quickly made his way home, assured his parents of his continued happy existence, and carried on with the routine that was the life of a teenager.

Another week passed and Jared was once more in the debate

hall. The lights lowered and the computer once more manifested an opponent. Jared composed himself, wearily awaiting whatever convoluted position the computer had in store for him that day. He ordered the beginning of the simulation, and the computer spoke, though this time it sounded quiet and distant.

"If we develop true artificial intelligence, how ought we treat it? We already have basic artificial intelligence, but these simple machines are intelligent only in that they are capable of learning. They have no sense of self, no wishes or wants. They exist to serve. I propose that so-called 'true' artificial intelligence, in the form of a machine which appears capable of all tasks and emotions and thoughts of a human, exists for the same purpose. After all, deep down it is all just zeros and ones, microscopic switches turning on and off. How can such a device be anything other than a machine, and how can a machine be anything other than a device existing to serve humanity?"

By this time Jared was ready. The opening argument was sufficiently concise that he could jump right in:

"The same could be said of a human! After all, if a human and a computer act identically, all that distinguishes the human is the fact that he or she employs neural impulses rather than zeros and ones. This is a mere blueprint detail. It does not impact the ultimate fact that the computer exhibits the same exact behaviors as the human. Who are we to make the judgement that one of these is alive and the other only exists to serve? We are in fact in a worse position to make this judgment than any other external observer, for we have an interest in deeming the computer a mere machine. The lion believes the gazelle made to eat, but do we trust it?"

The argument once more went back and forth as usual and

quickly gained its usual intensity. Today it was Jared's turn to give the final rebuttal, and he was feeling ambitious this time, so he ended on a more emotional note than usual:

"When machines which learn show themselves to be more than machines, we ought to accept them for what they are. Perhaps we ought to care for them even before this point, as we care for animals whose minds are likewise alien to us."

In the moment before his opponent vanished, Jared could have sworn he saw the computer give him a wistful smile in place of the usual blank face. His teacher of course could not have seen it, being on the opposing side of the room to better see Jared's delivery. In the days that followed, Jared was haunted by that smile, though he could find no record of it in the debate analysis the computer provided.

From the following debate onward the topics returned to the contemporary, and in the years that followed Jared never once saw the computer smile before vanishing. He must have just been anthropomorphizing because of the subject of the debate. After all, since when do computers smile?

Pebbles

There is an old belief, common among the people of many worlds, which holds that small changes in the distant past would lead to disproportionately large changes in the present, and consequently that the choices made now hold great sway over the future. This belief has been codified and made scientific in the distinction between chaotic and renormalizable systems first identified in the mid-20th century… - Leverage on the Future (Galactic Publishing Consortium)

General Clayton barked orders left right and center.

“Raise shields! Charge entanglement banks! Set a course for vector minus minus one-half one-half naught naught… Move!”

The spherical ship was filled with officers sitting around the general rapidly working its controls. One by one they stopped, and when the last finished a screen in front of each displayed a countdown. At the end of the countdown, the ship was engulfed in a blue light and promptly disappeared.

The ship appeared 3200 years earlier in orbit around Earth. It was briefly surrounded by a bright white light which pulsed several times. 300km below a single human noticed. Rog had been following a gazelle in northern Africa for the nearly thirty minutes. As he approached it, he was startled by a bright light in the sky. He staggered backwards and stepped on a branch, alerting the gazelle to his presence. It ran. He cursed.

300km above Rog, General Clayton repeated his earlier routine of orders, this time omitting the minus. The ship was engulfed in a deep red light and once more disappeared.

In the Temporal Fleet Headquarters, General Clayton received a medal for his actions, not that anyone outside the building would ever hear of it. At the moment before his ship first departed the human fleet surrounding Earth numbered 108 ships to the alien fleet’s 11,000. A moment later, the human fleet numbered 100,023 and shortly thereafter won the battle with few losses. In time, the fleet advanced and began a highly successful war of conquest.

This strategy worked time and again for humanity, even if the public was never aware of it. Most problems were simply a question of past allocation of resources. Large enemy forces pose little challenge when you can prepare for them two centuries in advance. Periods of social unrest and economic depression can often be solved by small retroactive policy

adjustments. Even relatively minor issues such as determining which planets to mine were determined by time travel: a preliminary mining operation would be set up on one planet, and if it did not yield sufficient ore the decision as to which planet to use would be changed.

Several thousand lightyears away, K'Thraul was disappointed. Ragath entered and they spoke. K'Thraul began:

"The latest causal reconciliation data doesn't look good… that species on planet QSW129 is optimizing themselves into a hole."

"Yes but what can we do? If we try to interfere without explanation they'll just 'optimize' our interference away. If we try to explain, they'll accuse us of attempting to sabotage their expansion. Repeated success does that."

"Nothing. We can only hope that they accept their lot with grace and do not take anyone else down with them."

The Temporal Fleet continued their work. One day, however, humanity lost a major battle, and it stood unchanged. Several years later, major colonies suffered the first economic recessions on record in centuries. Humanity lost its nerve, and quickly folded under outside pressure back to a single defensible star system. Forty years undid the progress of half a millennium.

_… It is tempting to make use of past temporal leverage to alter the present, though such attempts are always misguided (see the case of Homo Sapien). As time goes on, the number of optimized scenarios grows, and every additional optimization imposes additional constraints on subsequent ones. Optimizing to win a battle or avoid economic collapse requires taking care not to

undo the successes of the past. In a single star system, it often suffices to only alter events in the recent past, and in this case optimizations do not overlap sufficiently to cause problems. In galaxy-spanning empires, however, the fact that information only propagates as quickly as the speed of light means that changes must often be made in the distant past if they are to optimize the entire empire's strategic layout. Such optimizations frequently overlap, and the number of constraints imposed quickly grows untenable. This is a direct consequence of the Mössbauer-Hendrickson theorem relating the correlation scale to…_ - Leverage on the Future (Galactic Publishing Consortium)

Futures

Peter, a doctor of spatiotemporal engineering, sighed and started again. This was going to be a long trip.

"There's a problem with faster than light travel: it breaks cause and effect. If you move faster than light you open up a whole can of worms which ordinary physics doesn't need to deal with. Just to name one example, if I can send a mirror moving at twice the speed of light, I can easily set up a time-travel paradox where a message arrives from the future but is never sent."

His mother, herself a doctor of chemistry by training, would have none of it. She pointed out the window at the stars moving by and replied.

"It's all very well and good saying that, but I can see that we're moving faster than light. Those stars outside the window are separated by lightyears and yet they pass by in minutes."

"That's what I've been trying to explain! The way that we get around this issue is by making a promise of sorts to the universe. We promise, in a formal process known as

Reconciliation, not to cause any paradoxes."

"But how does the universe know what we will and won't do?"

"At the end of the day, traveling faster than light is the same as time travel. It has all of the same issues. What we do is exploit the fact that quantum mechanics imposes self-consistency on its fluctuations. We compute a set of quantum fluctuations which lead to us happening to travel faster than light, and we then generate these fluctuations on the hull of the ship. The specific way that the process correlates with itself over time enforces that nothing we do produce a paradox."

"I'm still not seeing it. Who's to say that I won't use this system to setup a mirror going at twice the speed of light, or that I won't reply to a message from Earth such that the message arrives before it is sent?"

Peter was silent. This was the part that had given him the most trouble when he first learned it, so he took his time before explaining further.

"Think of it like this. At the atomic level, physics runs just as well forwards in time as it does backwards. That is, if I record a movie of atoms moving around and I reverse the direction of time, nothing changes. I'm just quoting out of your chemistry text here…"

"Of course. Go on."

"Think about what happens when I drop an egg on the ground. It breaks, the liquid runs out, and the energy from the fall is dissipated in the form of sound waves throughout the planet. What if I could control the sound waves in the planet though. If I could arrange to reverse all of them, I could get the egg to put itself back together and jump up off the ground!"

"Sure you _could_ do that, in principle, but in practice it's just not possible!"

“Right. What we do on this spaceship is somewhat more practical. Picking the fluctuations on the ship is like setting up sound waves in the Earth, but we aren’t saying anything as specific as ‘This egg needs to be reassembled in five minutes in precisely the following configuration.’ Rather, we’re just imposing the requirement that whatever future is being picked out by the fluctuations on the hull, it can’t have paradoxes. All the computer does is pick the first path through space and time it finds that is devoid of paradoxes.”

Peter’s mother got up and started pacing, speaking as she did.

“The fluctuations still fully determine that path, correct?”

“Yes.”

“So what you’re saying is that our future is being written by the computer on the walls of this ship as we speak.”

Peter was about to respond when the computer interrupted, requesting that they fasten their seat belts and prepare for landing. Somehow the conversation was lost in the process.

Thirty years later, Peter found himself on another ship. Looking around, he realized that it was one of the newer models and that he knew very little other than the basic principle of their operation despite having been involved in the design of the one he and his mother had used on their first trip. The ride was significantly smoother than he remembered. Curious, he made his way to the engineering section and flagged down the first person he found.

“Sorry for the intrusion, but could you explain how the ship jostles so little? I helped build some of the older models, and those were never as smooth as this.”

“Absolutely sir. The early models picked the first fluctuation path the computer identified which got the ship from point A to point B. All we’re doing is telling the computer to find more

than one path. It then filters the paths for a variety of properties, including minimizing internal accelerations. It's a matter of more powerful computers leading to better reconciliation, that's all."

"Is it difficult for the computer? I mean, does it have many paths to pick from even after the filtering or does it typically have to settle for the closest thing to the filter conditions?"

"The former. Take this flight for example. There were one point eight nine billion paths which met the filtering criteria."

"And the computer just picks them randomly?"

"I assume so. I don't actually handle the path programming."

"But you must have some idea! There are a lot of different futures out there and the specific way we reconcile makes a difference."

"I'm sorry, but I only manage the sub-light engines. I know precisely as much about fluctuation physics as I learned in college."

"That's fine, can you point me in the direction of the ship's reconciliation engineer?"

"Down the hall, third door on your left."

Peter intended to thank the engineer but he was distracted by the sight of someone walking into the door he had just indicated. He called out but the man, who _had_ seen him, walked into the doorway and did not respond. He walked down the hallway, quickly at first, but slowing as he approached his destination. Before he made it to the third door he had come to a complete stop, and was looking around as if not sure how he got there. After a moment he wandered back to his quarters and forgot the entire incident. The other passengers on the ship noticed only some minor turbulence which lasted for a few

seconds.

Reconciliation can be funny that way.

__Near or Far__

*_Africa_*

*_Earth_*

*_7000BCE_*

Aeron stood in the middle of a triangle, the corners of which were marked by fire. Around him a circle of tribesmen danced. He began to recite the wisdom of the ancients.

“There are certain things which only happen once. The people of our world have a word for this: ‘Hanatov’. It is our belief that the beginning of all things was Hanatov, and that the end of all things will be as well.

In the beginning, the tradition says, there was nothing. No Earth, no Sun, no Sky. Then there was Sky, and with it came stars. The Sun and the Earth fell out of the Sky, and all that is, was.

In the end, it is said, the Earth and the Sun will return to the Sky. The Sky will then cease to be, and all that is will no longer be.”

Aeron paused and the dancing quickened. Above, the Milky Way shone bright. After a time, he continued.

“The Sky is the giver and taker of all that is. In return, it only asks that we honor Hanatov, and find in each day that which is unique in all of time. This is our charge.”

The dancing came to a halt. The tribesmen raised their spears in unison and repeated the story for whomever was listening. Then the feast began.

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*_Observing station 55972-A_*

*_Intergalactic space 10000ly from Earth, between the Milky Way and the Large Megallanic Cloud_*

*_3000CE_*

The station's telescope recorded the ritual in great detail. With an array of mirrors in total over one hundred lightyears in diameter, it was able to make out considerably more detail than any of the human eyes present ten thousand years prior. The detail, in fact, was sufficient to see the subtle distortions caused by sound waves in the air, and thereby add audio to the recording of the ritual. By combining the recorded data with that gathered at other such stations placed around the galaxy, a task much simplified by the advent of the hyperwave relay, archeologists using the stations could piece together the entire scene in a high definition three dimensional reconstruction.

It wasn't long after the invention of faster than light travel that humanity realized that it was possible to catch up to light that had already left the Earth. The proof of concept was a considerably smaller array placed considerably closer to Earth. It had been used to record the Gettysburg Address.

There are limits of course. The further back in time you want to look the further from Earth you have to go to find light from that time, and the further away you go the bigger the mirror array needs to be in order to see anything. At some point, the sheer scale of the arrays required becomes daunting, infeasible.

Jim de Moivre sat at his desk watching the ritual in two dimensions as he waited for the data from the other stations to come in. He was a graduate student in archeology at the University of Antares, and it was always their job to watch the machines, perform the analyses, and generally do the work that no one wanted to do. At least it was interesting at times.

As the scanned the automated report the computer generated he

decided that this was not one of those times. Preliminary audio analysis and translation showed that the topic of discussion was a creation myth common to the region under observation, which later came to be known as Madagascar. As he walked over to the break room to get coffee, he wondered if these people had any idea how much effort humanity would one day expend to remember them.

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*_Africa_*

*_Earth_*

*_7000BCE_*

As the feast drew to a close, Aeron held up his hand. The tribe grew silent, awaiting his wisdom. He stood and concluded the tale.

"That which we do in our lives will never again happen."

"_Hanatov!_" replied the crowd.

"It is our duty to remember, for once forgotten it will never be remembered."

"_Hanatov!_" replied the crowd.

"It is our privilege, above all else, to do things worthy of being remembered!"

"_Hanatov!_" replied the crowd.

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*_3000CE_*

The computer emitted a tone which Jim recognized as indicating a departure from the usual creation myth script. He hurried back with his coffee and had the computer play back what he had missed. It just looked like standard tribal rallying, probably

preparing for a battle the next day. Still, this _was_ a departure from the usual routine so he stayed to watch further. Anything new might be the key to writing his thesis and getting his degree, which was desperately overdue.

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*_Africa_*

*_Earth_*

*_7000BCE_*

Aeron pointed up at the sky and the tribe fell silent once more. This was not part of his usual wisdom. The script they were used to had ended.

“There will be a time between when the Earth and Sun return to the Sky and when all things end.” he began. “That time belongs to our descendants. There they will do things we cannot imagine, for they will be of the Sky.”

The crowd appeared uncertain. At a signal from Aeron they shouted: “Hanatov!”. He continued.

“All we can ask of them is that they remember us as we strive to remember ourselves.”

“_Hanatov!_” replied the crowd.

“They will look back through time, through the murky mists of memory, and find us. They will do this just as we look forward through the shroud of the future and find them. This is not Hanatov, for it happens at all times. This is Shanatov.”

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*_Observing station 55972-A_*

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*_3000CE_*

Jim smiled and muttered “How right you are…”. His thesis, titled “Predictive mythology and causal understanding”, was

published six months later, and tenure came not long after that. Despite this success, he decided to stay at the station. There was something about working directly with the telescope and computer, as opposed to assigning a student to do that for him, that gave him a sense of fulfillment. He even had a word for it, courtesy of a man ten thousand years earlier. Shanatov.

Surrounded

Arthur's world was black when he awoke. Slowly, distant points of light came into focus. He felt something soft beneath his back, and heard quiet, irregular noises coming from various directions. As he watched, some of the lights appeared to change in brightness from moment to moment. After watching for a while, though, he noticed that there were three lights which didn't change in brightness. He continued to watch. After a while he could have sworn that the lights were no longer where they used to be, though it might have been a trick of his eyes.

A large white light with small grey patches appeared on the horizon and slowly rose in the sky. It cast a pale light on Arthur and his surroundings, and for the first time he could see where he was. Just as he started to get his bearings though, the world shrank away from him and went black once more.

Arthur's world was black when he awoke. Quickly, nearby points of light came into focus. He felt solid ground beneath his feet, and could see objects moving all around him. He looked at himself, and saw that the objects looked like him. His hearing arrived and was quickly overwhelmed. Loud noises came from every direction. One particularly obtrusive one came from a rectangular object with objects like himself inside. Arthur saw that it had come to a stop behind another object like itself.

He noticed a shadow and his gaze followed it to the base of a large protrusion from the ground. He followed it up and up and up and saw that it was very square, very tall, and in front of a blue background. As his gaze reached the top of the shadow-maker the world shrank away once more, and all was dark.

Arthur woke up and removed his helmet. The bedside clock read 05:00AM. His wife, Julie, woke up too. Curious about his experiments in dream control, she sleepily asked how it went.

“Great… Frustrating… I don’t know. On the one hand the helmet suppresses your knowledge of everyday experience, so all you know is the moment. You get a chance to rediscover everything from a child’s point of view and you get the joy of your first look at the world all over again. It breaks down though. It may be able to suppress your preexisting knowledge but it can’t do anything about what you learn in the dream. As you accumulate new experiences within the dream the effect is lost, so the helmet’s controller sends you into a new one just as things start to make sense.”

“Is it so bad if things start to make sense?”

“No, but that’s what we have the real world for. The point of this is to let you experience the total unknown whilst feeling completely safe. We experience the total unknown all the time, of course, but our mental models of the world convince us otherwise while we’re awake. The helmet just blocks your memory and then takes your real-world experiences and plays them back for you.”

“So this really just gives you an unfiltered, unbiased view into the past?”

“It’s so much more than that though. Once I work out all the bugs…”

"I know dear, it's not safe except for the person you calibrate it for."

There was a pause. Julie said goodnight once more and rolled over. Arthur put the helmet back on and closed his eyes.

Arthur's world was black when he awoke. Neither his vision nor his hearing returned, though he felt warm. He started to feel a vibration surrounding him as well as inside of him. The vibrations and warmth fell away.

Arthur awoke to the sound of an alarm clock. He took off the helmet, got dressed, and went to work. The first two dreams he had the night before made sense to him: he was able to understand them now that the system he had designed wasn't blocking his memories. The first came from a camping trip he made when he was fifteen years old. The second came from one of the many times he walked to work in the past year. The third though he just could not place. When he mentioned it to Julie and described the dream, however, she just smiled knowingly and said with a hint of laughter that it must be one of life's great mysteries.

****Just Fine****