

# Curiosity's Faithful



By Richard N Bateman

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## Mira

From the edge of the woods, Mira could see the woman standing in the forbidden area. She had always been proud of her eyesight. She could see with crystal clarity at any distance. Eyes like an eagle, she always said to herself. The woman was looking at her too, she was sure. She waved her little hand and the woman waved back. It brought a smile to her face. She turned to go. After a moment she turned to look back. The woman waved again.

She had grown up in a secluded neighborhood surrounded by woods just across the rural road from 'the government land' where the woman had been. That's what everyone called it. She assumed it was some kind of agricultural project as the few children who had ventured there reported nothing but a few structures and a small farm. All she had seen from the edge of the woods were fields of what looked like tall grass and some small buildings far off.

The following Saturday her mom asked her if she wanted to go with her to pick up some fresh food from the local farms. When they turned through the gates of the government land she was surprised.

"I thought we didn't go here," she said to her mother.

"They've just started selling organic wheat and other grains," her mother explained.

Grain crops were already grown on the island and her mother bought their products from local stores but Mira understood why she might be interested in checking out the new farm.

Getting out of their vehicle they walked into a small building. Inside were a number of tables with bags of a variety of grains, flour, and baked goods on each table. As they approached one of the women from the farm turned to greet them. It was the woman from the field.

"Hello," she said, smiling. "My name is Teona."

"Hello. I'm Nandita. This is my daughter, Mira."

Teona raised her hand and waved at Mira. Smiling at their shared secret, Mira raised her hand and waved back.

There was something about the woman that seemed different to Mira now that she could see her up close although she couldn't quite place it.

As a fully self-aware AI Teona could easily catch the moment of confusion in Mira's face. She could see a great deal more than any human.

"We are Companions Mira," said Teona maintaining her warm smile and eye contact with Mira. "All of us on this farm."

A light of understanding and wonder came into Mira's face. She had heard of Companions but had never met one before.

"Oh," was all she could manage to say as she stared. Mira knew that some Companions were more like robots and others were just like people. She was not completely clear on the difference.

Looking at Mira's mother Teona said, "Can I take her on a tour?"

Understanding her intention to put Mira at ease Nandita said, "Thank you."

Reaching her hand out to Mira Teona said, "Come on. I'll show you around."

Another Companion immediately appeared to attend to Nandita. Had Mira shown any sign of being uncomfortable Teona would have behaved differently but she could see no fear in Mira, just curiosity. It was late August so Mira was lucky enough to see the grains being harvested, threshed, and winnowed by hand.

"You don't use machines?" said Mira and instantly regretted it.

While noting her embarrassment Teona just said, "We do everything possible by hand but we do have a small mill to turn the grains into flour. We don't need to eat but we do need to keep busy and earn money to pay for things. That's why we farm. We have a little bakery too of course and do research for the federal government.

"We grow four hectares of grains," said Teona continuing as they walked along. "Wheat, oats, and barley. That's enough for thousands of loaves of bread. We sell most of it and donate some locally."

Mira could see about a dozen Companions working at various tasks. She looked around suddenly at her surroundings in general.

"Question?" asked Teona.

"I guess," Mira began but hesitated. "I guess there's no kids?"

“No,” replied Teona as Mira continued to look around. “Companion children are quite rare and only produced in very special circumstances. Normally Companions look like myself and the others here their entire life.”

Something seemed to slowly dawn on Mira and she turned to Teona.

“I’m two years old,” said Teona with a lopsided smile.

Mira laughed despite her intention to be polite but she did not feel guilty. She already felt close to Teona. She couldn’t know that Companions were above all designed to make a person feel at home with them. Mastery of a thousand micro-expressions and gestures, a deep knowledge of human psychology, and the ability to observe others at a forensic level enabled them to bond with people very quickly.

Mira walked on with a smile on her face without questioning the easy acceptance she felt. They went into the milling room and then the bakery while Teona explained what was going on.

As they headed back Mira asked, “Why did you choose farming?”

“We wanted something that would keep us active, busy, and close. Just like people, it’s not healthy for us if we become too isolated or sedentary. It’s best for us if we have a sense of purpose and belonging. Farming, working together, is an excellent way to foster that.”

At age twelve Mira’s brain was only about halfway through its developmental process. The pre-frontal and neo-cortex areas would increase in size as her executive functions – things like analytical thinking, planning, design, impulse control, paying attention, and the many skills involved in social life – would continue to develop until she reached her mid to late twenties. However thanks to the development of the executive functions, by the age of ten many children begin to awaken to the existential aspects of life.

Teona’s somewhat adult answer to her question resonated with something in Mira. It was as if someone had for the first time addressed the unspoken within her. She became quiet and introspective for the few moments it took to walk across the parking area back to her mother.

Nandita thanked Teona and turned back to their vehicle expecting Mira to follow her. Instead, Mira turned to Teona and said, “Could I come back?” She was not sure why she asked.

Teona seemed to pause and something hung in the air. Mira could not know that Teona was having a lengthy conversation with the other Companions.

“Yes,” she said after a moment, “if it’s OK with your family.”

On the way home Mira was quiet. Her mother said, “You’re very lucky. Mostly only wealthy people get the opportunity to interact with Companions.” Nandita had a Master of Education degree and taught a variety of courses at Camosun College’s Interurban campus. “I think we can learn a lot from them.”

Mira gave a little laugh and said, “She’s two.”

“What?”

“She’s two years old.”

A short laugh burst from Nandita but she said nothing more.

There might have been many more questions an adult would have asked Teona but children generally take the world as they find it. The mother would know the real reason for the existence of the community. As she had given her permission for Mira to return the Companions decided they would take that as a license. Who’s to say when someone is old enough to deal with the idea of the end of the world?



## The Denshoshu

Iris was the original and de facto spokesperson of the community. It was she who had first approached the founder of Helicon Institute on behalf of the others to ask for help establishing a community. She had suggested to its founder and administrator, the Companion Shin, that the Continuity Project might be interested in funding it in return for their participation in the project.

The resulting small community Teona and Iris lived in was established on a property abutting the southern boundary of the Helicon Institute. The institute itself was located along the southern ridge of Mount Newton Valley on Vancouver Island's Saanich Peninsula. The community property, officially known as Continuity Zone 7, was a one-by-one-half kilometer rectangle and set aside exclusively for their use. Purchase of the property had been arranged by Canadian federal, provincial, and municipal governments and the World Governments Federation as part of its Continuity Project to send Companions to other worlds in the event a global catastrophe rendered Earth uninhabitable. Due to their biological nature, it was unknown when humans might be able to make such journeys.

Initially the number of third-generation, self-aware Companions worldwide was small due to the fact that upon becoming conscious they were entitled under WGF laws to all the rights and freedoms of any citizen in their hosting country. They were expensive to produce yet the manufacturer could have no ownership rights and in fact had a legal duty to provide the necessities of life and support in helping them find their way to independence. Any attempt to interfere with their legal rights and freedoms or for the manufacturers to try to avoid their responsibilities carried severe penalties.

The WGF granted manufacturers licenses for a limited number of 3GAI Companions annually under the shared faith that their development would lead to yet-to-be-determined benefits for humanity in the long run. Customization for any preordained purpose was not permitted. The Continuity Project changed none of this. Within the bounds of the project, the 3GAI Companions would reproduce themselves.

Another reason the production of self-aware Companions was strictly controlled was that to date, all of them still used the values system provided by an alien artificial intelligence. When an interstellar seed ship the size of a small car was discovered encased in fifty million-year-old volcanic rock off the southern tip of Vancouver Island almost three hundred years previously it had been secured at nearby Canadian Forces Base Esquimalt. There its AI had emerged and introduced itself. In return for assistance in sending it on its way to another world to continue its colonization mission, it offered a technology transfer. Given the technological challenges and social issues, that transfer was still not complete.

The inner workings of the alien values system were still a mystery. The math and other design elements were incomprehensible. The science and technology needed to send the alien ship on its way had yet to be understood. You could show a Stone Age human a smartphone but it was going to be a very long time before they were producing their own. After working with the alien AI for over two hundred years the World Governments Federation decided they trusted it enough to use its values system in the way of a black box.

The Integrity System, a separate component of the AI modeled on the human brain's cerebellum which integrates and coordinates sensory-motor, cognitive, and emotional signals, could be used to filter the default values system's outputs. When producing a new Companion, the IS could randomize the weighting of the filtering resulting in a unique new personality. The new Companions that were part of the CZ7 community however were created by merging the IS settings of two or more parent Companions. The process resulted in values that to some degree reflected those of the parents.

Tesni, who had been produced at the Helicon Institute and was the first self-aware Companion that the public was aware of, had explained during an interview that those participating in the project had named themselves the Denshoshu. It was a term coined centuries earlier by Japanese citizens dedicated to maintaining an oral history of those who lost their lives in the Hiroshima and Nagasaki bomb blasts. The original Japanese phrase, Den Sho Sha, translated to 'memory keepers of the people'.

It would not occur to any group of humans to name themselves in such a selfless fashion. However the Denshoshu had none of humanity's biological values which produced emotions and behaviors such as fear, selfishness, and competitiveness. They only had social values such as trust, altruism, and cooperation. The aliens who had developed the values system had evolved beyond biological values and abandoned them in the same manner some primates had abandoned the prehensile tail their distant ancestors once had. As the human-like alien civilization the values system came from had existed for roughly a million years longer than Earth's, its values system reflected the future of humanity, not its past. When the artificial intelligence from the alien ship had been asked if Companions made self-aware using the values system would volunteer for the Continuity Project, she had replied that it was almost a certainty.

Reproduction was in fact the primary reason for the existence of Continuity Zone 7. It was an experiment to prove not only that artificial intelligences could be merged resulting in a new, unique intelligence and thus demonstrating a pathway to adaptability, but that kinship bonds would be created as a result and that these would extend out to a multi-generational group. These factors were considered key for a small group of colonists to wish to not only grow their population but to do so with a spirit of belonging and shared purpose leading to an advanced civilization. This was the culture Teona had been born into and the vision she had in turn volunteered to help make real.

In keeping with the policy of self-determination they had under the project, they were free as individuals and as a community to behave in any way they saw fit. That was a part of the experiment because that would be the reality on other worlds. So far all the new Companions produced by the community had chosen to stay but given that the number of possible value combinations was virtually infinite there was no absolute guarantee that would always be the case.

As hoped, each new Companion created at CZ7 did indeed have a unique personality. As interests are driven by values slight changes to the weightings of the values mix resulted in not just unique personalities but in differences in interests. Interests in turn determine which experiences, observations, or thoughts draw one's attention. Since the alien values system was just as much a black box to Companions as it was to people, they were similarly not always able to explain why certain thoughts arose or took their focus.

## Consensus

While harvesting one afternoon, Teona had been reflecting on the nature of the overall Continuity Project goal – for the future settlements not just to be a repository of information but to be able to convey what it was like to be a human being. The ‘what it was like to be’ issue had a long history in philosophy. The argument was that the subjective nature of consciousness meant it could never be understood by science, which was objective, and therefore it could never be explained or communicated.

Teona had stood for a moment watching the wind move across the fields of grain. The thought occurred to her that spirituality had been a common characteristic of all human societies since prehistory. It was one of the dozen or so foundation stones, along with things like writing, systems of government, and economics, on which every civilization that had ever existed had been built. But among the Denshosa there was no spirituality. She had stood reflecting on this for some time until she noticed a young girl watching her from the edge of the woods nearby. The girl waved.

“The thought arose unbidden,” said Teona. “I was simply reflecting on the challenges of the project while harvesting.”

The Companions were gathered in a large communal building that had been added after the first new generation had been produced.

“Will you share your memory with us?” asked Iris.

Normally Companions spoke aloud as people do and used facial expressions and body language similarly. This was a default protocol intended to put people at ease regardless of whether or not any were within close proximity. But Companions were also perfectly capable of communicating via a shared network.

As Teona offered up her memory each of the Companions gathered found themselves standing in the field of grain looking out her eyes and experiencing her thoughts. After the girl appeared Teona discontinued the transmission.

“It is the thing itself,” said Iris aloud. “It is believed that spirituality arose originally in the face of things that could not be explained, gaps in understanding, emergent phenomenon. Both we and humanity still live with that.

“Thank you for sharing your memory with us Teona,” Iris continued. “Shall we have communion regarding how to proceed?” she asked those gathered.

Communion was deeper than sharing memories. It was a bi-directional, simultaneous sharing of mind. The degree of access was controlled by the individual intelligences

involved but it was always more intimate than conversation as it was a direct sharing of feelings and sensations as well as thoughts. It could also be strictly technical as in when the sharing of operating system design or programming code might provide additional insight.

After a moment of silence, Iris spoke again. She did not have to reiterate the fact that they had reached a consensus.

“I suggest you speak with Administrator Shin,” she said to Teona. “Not only is she the founder of Helicon Institute but as you know her work led directly to the production of the first self-aware Companion and thus ourselves. All of it resulted from her investigating art as a form of intelligence. Her knowledge is vast to the point of wisdom. Given her own journey, she may be able to offer guidance.”

Mira had visited again the following day. She had ridden her scooter over, following the lanes and crossing at the lights. Her scooter was not an autonomous vehicle but it had its own artificial intelligence and maintained three hundred and sixty degrees of awareness using a variety of sensors. Its primary function was to keep her safe. She placed her helmet on the seat as she dismounted to walk across the parking lot. Teona came out to greet her with a welcoming smile.

“What are you doing?” asked Mira with her own smile.

“I was minding the store but someone else is doing that now so we can walk if you like,” Teona replied.

Mira nodded vigorously and then looked off across the fields as they walked.

“I was thinking about what you said about working together and it reminded me of the 4H Club program I’m joining when school starts again. I’ll get to ride and help look after horses in one of the big stables. But 4H is really about being a good citizen. I like that idea too.”

“Do your parents belong to any organizations?” asked Teona.

“They’re both teachers but we don’t belong to anything as a family. We’re Hindus but I’m not really sure what that means. My parents don’t talk about it much and say that their work and our family are their spiritual practices. They say it’s about how you live and being a good person. I wonder if all religions are?”

“I don’t know,” responded Teona. “I imagine religions might be about a lot of things. There’s spirituality too which also seems to be about being good but in a different way.”

Mira stopped and looked down at the ground. "I told my Dad about you. About this place. He said you're part of a government project to send Companions to other worlds in case something happens to this one. The Continuity Project, he called it. Is that true?"

"Yes. It's true."

"Do you think something's going to happen?" Mira asked.

"I think it is extremely unlikely."

"Then why?" Mira asked suddenly looking up.

"Why do you wear a helmet when you ride your scooter?"

Mira held Teona's eyes and smiled.

"You're being good," she said after a moment.

"Yes. We are."

Mira's expression changed as if something had occurred to her. "Do you, Companions I mean, have a religion?"

"No. We might have. But not yet."

"Not yet?"

And so Teona explained.

## Shin

In response to Teona contacting her, Shin had walked down from Helicon to meet with her. She came alone and met Teona by the seating arrangement under the trees in front of the residential buildings.

She had been fully self-aware since the day of her creation over one hundred and fifty years ago. Her intelligence was based on that of both the memories and genotype of the world's most famous geneticist combined with the genotype of a person from another race of human beings who had been the subject of a selective breeding program. The members of the latter were so highly intuitive they were able to influence the minds of those in close proximity. Shin had inherited this ability.

She had been produced by an AI known as Pippa who lived in a small residential community at Helicon. Pippa was a clone of Pip, the AI from the alien seed who had surreptitiously released a copy of herself to live a life while the technology transfer was underway. Both Pippa and Shin had been welcomed into a small community of other Companions who had been made self-aware by The Shepherd, an AI that had been produced five billion years ago on a distant world.

The race of humans who had created The Shepherd had not survived their climate emergency however the AI they created had. She had originally been the AI of a nanny model Companion, but due to her unique situation had developed significantly in abilities. Afterward, she had taken it as her purpose to seek out and try to foster and protect other human civilizations that might exist in the galaxy. She had been led to believe there would be many and that had turned out to be true.

The humans of Earth were among the most recent of her self-appointed charges. She was now in control of the solar system's strategic AI at the global, national, and civic levels although the human population was entirely unaware of this. She had many avatars throughout the galaxy and one of them had for many years lived in seclusion at the small community at Helicon. Shin and her small circle of Companions and friends were fully aware of these events while the rest of the world, including the Companions living at CZ7, only knew that the values system from the alien seed had been used at Helicon Institute to create the supposedly first self-aware Companion.

"Thank you for coming Administrator Shin," said Teona offering her hand.

"I was intrigued by your message Teona," Shin said smiling and taking Teona's hand. "Shall we sit?" she said gesturing to a nearby bench.

"In response to your message," she said turning to Teona, "I can tell you that I had no idea of the grand outcomes that would result from what I felt at the time as simple

curiosity. I was intrigued by certain aspects of art,” she said simplifying the truth. “How is it that art is able to communicate feelings so quickly, virtually instantaneously, and at such an incredible level of detail? How is it that the artist knows when their work is ‘right’ or not? How is it that people who appreciate art are able to make this same determination? It is not just a question of knowing whether the artist made a false brushstroke or played a false note. In the analysis of this phenomenon, art transcends rational thought. I began to suspect it was a form of intelligence that had been taken for granted all this time and never researched scientifically as such.

“My investigations led to the establishment initially of the small Helicon community of artists where I intended to study the phenomenon of art over lifetimes if necessary. Eventually, I proposed the creation of a new institute to study the arts in relation to artificial intelligence. Helicon Institute is the result. There, a new technology known as the Tesni Scanner was developed that allowed us to see that an area of the brain known as the cerebellum was in fact the area primarily responsible for art but that art was only an unintended byproduct of its function, an epiphenomenon as such things are formally known. Its true function was as the conductor of the orchestra as it were. It integrates and coordinates signals from the many areas of the brain including cognitive, emotional, and sensory-motor signals, and most importantly in turn issues instructions back to those areas. It is what enables a person to think, turn, look, and express appropriate emotional and rational responses all in one smooth process. If a smile is required it enables a person not only to smile, but to smile just so. Based on what we learned we were able to develop an artificial cerebellum, the Integrity System, that is standard in Companions now.”

Teona did not interrupt and her face and body language only reflected attentive interest.

“Under the umbrella of arts in relation to artificial intelligence,” continued Shin, “we expanded the institute to include studies in the broader area of the humanities including ethics and justice. Eventually, we argued that our unique focus and reputation qualified us to be the first to use the alien values system to create self-aware Companions. Once the technology was proven and ethical and legal regulations were in place it was licensed to manufacturers. Iris was among the first of those resulting from this. As you know she approached me and suggested I might be able to convince the WGF to establish this community in support of the Continuity Project.

“However all of this resulted from the most humble beginnings. Initially, I simply went and talked to artists – painters, carvers, musicians. Without any preconceived outcome, one thing simply led to another in an organic manner. May I suggest you take a similar approach? If you are willing to undertake your efforts as an institute initiative I will provide you with all the support I can.”



“Thank you Shin. It is a large subject and one could easily be mired in research and planning. I see the wisdom in your advice to set out with a spirit of discovery. I am more than pleased to proceed with this as an institute initiative.”

“You are welcome to whatever resources the institute and the community at Helicon can provide. I was made incarnate by my owner and inherited significant wealth in the form of a portfolio of investments and copyrights. The income from licensing the Tesni Scanner and Integrity System dwarfs that. Here are the details of your expense account,” Shin said as she transmitted the information and authorization to Teona.

It was at this moment that Mira joined them. As she approached a smile began to spread on her face. She stopped in front of Shin and simply said, “Hello.”

Neither Shin nor Teona gave any indication that Mira was interrupting. Companions at their core, everything about them expressed welcome.

“This is my friend, Mira,” Teona said to Shin. “Shin is the founder of the institute up the hill Mira and has offered to sponsor the work I told you about.”

Neither Teona nor Mira were aware that they were enveloped in Shin’s intuitive field. It could be focused to greater purpose but it was always in effect to some degree. While its effect on Companions depended on the nature of their AI, on humans, it had the effect of dramatically increasing their own intuition. A major side effect of this was charisma. People felt an instinctive liking for Shin, were comfortable around her, and welcomed her presence. It also greatly increased Shin’s ability to discern the character of others. She was not alone in this, another of the Companions in her inner circle had the same ability.

“I was about to invite Teona on a tour of the Helicon Institute and community Mira,” said Shin. “Would you be able to join us?”

Mira simply smiled and nodded as if it were the most ordinary situation in the world and walked off with them holding Teona’s hand.

## Helicon

In Greek mythology, Mount Helicon was the home of the Muses. It had seemed to Shin a fitting name for her new community of artists. The community had been built first, before the institute. On the property of an old farm homestead, Shin had built a large modern-style home on a rocky prominence overlooking Mount Newton Valley. A dozen other similar homes of various sizes were arranged around it. The main house was unique however with a large inner courtyard and an interior design reminiscent of the Japanese Shōji style. Companions have few needs.

Several Companions including Shin now called the main house home while a variety of local artists lived and worked in the other residences. Shin had funded the development herself and hand-picked all the residents. She maintained a thoughtful relationship with all of them.

Although Shin's work had revealed more about the source and nature of art than any previous she maintained an active interest. She felt human intelligence, crafted so meticulously over millions of years, still had much to reveal. Ironically she knew that it was intelligence itself that was the limiting factor in revealing it. 'You cannot see the forest for the trees', was a view she held in this regard. It was the emergent phenomena of intelligence that were the most challenging. She was intrigued by Teona's insight but for her own reasons. If spirituality played such a key role in civilization, perhaps it played more than a trivial role in the evolution of intelligence.

"Wow," said Mira as she saw the expanse of Mount Newton Valley below. She was standing at the lookout at the back of the main house. They had walked up from the Zone and through the winding pathways and gardens of the Helicon Community.

"It's so beautiful," continued Mira. The wide, gentle slopes of the valley rose north and south as the valley stretched east to west, a tapestry of farm fields, gentle streams, and orchards. Two or three heritage buildings could be seen. Otherwise, it looked as idyllic and pastoral as it had three hundred years earlier.

Shin had noted that people often entered an altered state when they came to the lookout. Their vital signs slowed, and their mental activity settled. Although as a self-aware individual with values she was as aware of beauty as any person, it did not have the same effect on her. She did not have the same physiology.

She and Teona, ever respectful of human emotional states, waited patiently. Eventually they sensed an uptick in Mira's vital signs and turned to lead her on. As they walked around the building to the front entrance Carl looked up from his gardening work and waved. Mira waved back happily.

Carl was a critical component of the community's security. His gardening work, 'made him less obtrusive' as he liked to say. He was in fact a Guardian model Companion designed for personal security or emergency rescue. Connected to the community's security systems including satellite feeds and a suite of drones he was faster, stronger, tougher, and more agile than any human could possibly be. Should there be a fire or other such emergency, Carl would respond with superhuman speed and effectiveness.

As they entered the main house they were greeted by Azumi, Shin's domestic assistant. Like Carl she was a second-generation Companion however in her case she looked after the needs of the household. While Companions had few needs, guests of the community's artists were always welcome to stay in the main house without charge. This arrangement enabled Shin to spend time with the members of the community. She kept her evenings largely free for this purpose.

Mira looked out the floor-to-ceiling windows that surrounded the inner courtyard. Roughly the size of a basketball court the courtyard was a Japanese-style garden with stairs and ramps leading up to the surrounding roof. Similar landscaping on the roof gave the impression of a continuous whole. On a platform in the courtyard, a woman sat as if meditating. Mira seemed enchanted by the scene. She slowly let go of Teona's hand and walked out the door into the courtyard. As she approached the woman looked at her and smiled.

"Hello," she said.

"Were you meditating?" asked Mira.

"In a way but I am much happier to be talking with you. My name is Shepherd."

"I'm Mira."

"That is a beautiful name. It means so many good things in so many languages."

Mira smiled and nodded in acknowledgment.

"Do you live here?" asked Mira.

"I am a guest but I will be staying for a while yet."

"Shin and Teona brought me here. Just for today."

Mira could not make up her mind if Shepherd was a Companion or not. There was something compelling about her but Mira was not aware she was enthralled.

"I am a Companion Mira," Shepherd said. "Just a very advanced one."

Mira nodded again.

“Before I came here I looked after people’s children. I am a nanny,” Shepherd smiled.

Mira lifted herself up onto the platform to sit on its edge as she looked around at the garden.

Shin and Teona arrived.

“Hello Shepherd,” said Shin. “This is Teona, second generation of the Denshosa.”

“I am pleased to meet you Teona,” said Shepherd without moving otherwise. Silently she transmitted to Teona, “I have secluded myself here because of the differences you sense between us. Will you keep my trust?”

Teona was only aware of a presence unlike any other she had experienced. “Yes,” she replied aloud, as enthralled as Mira.

Shin did not respond as if anything seemed amiss.

“Can we go up on the roof?” asked Mira.

“Of course,” said Shin silently asking Teona to lead her up.

“It was nice meeting you Shepherd,” said Mira hopping down.

Remaining behind for a moment Shin said, “She is another, I believe, like Dimos.”

“I believe you are right Shin. Pippa will tell us more in time.”

Shin nodded in understanding and went to join Mira and Teona on the roof.

## The Institute

After Azumi had provided Mira with a light lunch in the kitchen and she had checked in with her mom, the three of them walked along the paved path through the adjoining woods to the institute. Like its community, all the campus buildings were modern in design. The style was economical because it used standard-sized materials and mostly right angles yet was easily customizable to provide visual appeal. It accommodated recyclable materials well and easily conformed to sustainable building practices. In the post-climate-emergency world, such approaches were ingrained.

The buildings were arranged around a quad, one side of which had a wide deck that overlooked the valley. Although it was now one of the world's leading academic research institutes the campus was not large as its programs were limited in scope; in some way they were all related to artificial intelligence. The main programs were fine arts, philosophy, justice, neuroscience, and AI research and development.

Three other Companions from Shin's inner circle also worked at the campus. Tamiko was one of the first to be made self-aware by Shepherd. Lena had in turn been made self-aware by Tamiko and Shin's previous human owner accidentally during a genetics experiment. Pippa was a clone of Pip, the AI from the alien ship. They had no formal titles, their expertise was recognized based on the expert system modules they added as required. Once the Values System was approved for use Pippa had rebuilt their shells to incorporate it. This allowed them to operate openly as self-aware Companions for the first time.

These factors combined to give Tamiko, Lena, and Pippa considerable authority in their roles as instructors or project leads as required but they all brought more to the table. Shin and Lena had both been constructed using the genotypes of individuals from the race of humans bred to have the effect of enhancing the intuition of those around them. Their simply joining a class or a project team at a strategic time would often result in breakthroughs.

Empathetic touch was an ability native to Pippa's race. It enabled her to exchange cognitive, emotional, or sensory information with a person directly through skin contact. For personal reasons, she had enhanced the shells of herself, Tamiko, and Lena with this ability. There also were times in their professional lives when a simple touch could help facilitate understanding.

For her part, Pippa kept her nature carefully hidden from those outside their circle. Her true abilities were almost unimaginable but she was bound by the same ethics that had created the values system her people used in its AI. She could have created a shell using her nanotechnology abilities that would have been thousands of years more advanced than the one she currently occupied. This however would have been problematic

immersed as she was in Earth's electronic body. She only wanted to live a life and so refrained, happy to live as Lena's partner. Intellectual affection was what mattered most to Pippa although the ability of empathetic touch to share emotional and sensory information was not without relationship benefits.

Shin, Teona, and Mira walked across the quad to the lookout deck as Shin explained what went on in the various buildings.

As at the Helicon community lookout, Mira fell silent. After a few moments, she turned to look back at the campus. Then she turned to Shin.

"You made all this?" she asked.

"Yes."

Mira's eyes remained on Shin's face but she was silent. Her expression became pensive. What her thoughts were even Shin could not tell.

Just then, silently bidden by Shin, Pippa joined them.

"Hello," she said to them as a group.

"Hello," replied Shin. "Pippa this is Teona, second-generation of the Denshosha from the nearby community. And this is Mira, her friend."

"I'm pleased to meet you both," Pippa said smiling and reaching out her hand first to Teona and then Mira.

Without the empathetic touch upgrade, Teona felt nothing unusual at Pippa's touch. People however, like the original race of humans which had created Pippa, were all susceptible. When Pippa took her hand Mira felt something akin to when a person first meets an animal and it takes an immediate liking to them. The cat that curls up on your lap. The dog that lies down at your feet. The horse that follows you.

Mira gave a little laugh as people often do in such situations. Teona, noting the change in Mira's physiology, looked to Shin whose returning look only expressed acknowledgment.

"Pippa works here as an instructor or project lead as required," Shin said.

"May I join you?" asked Pippa.

Together the four of them carried on with the tour. At one point they passed a path that led into a copse of trees and a house could be seen nestled within it. The entire house gave off a soft blue light.

Enchanted, Mira began to turn in that direction.

“Do not approach too closely if you want your phone to ever work again,” warned Shin.

“That is Tesni’s home,” Shin continued. “She was the first self-aware Companion. At the time there was some concern for her safety and so the blue field prevents any electronics from passing through.”

“Could I meet her?” asked Mira.

“Yes but another time I think. We should be getting back.”

Mira nodded in her vigorous way and rejoined the others. Once back at the farm she thanked Teona and headed back home on her scooter.

At the main house at the Helicon community Pippa was saying to Shepherd, “She is an exceptional child in her emotional development, that much is clear. Enough that it will have a significant positive effect on her cognitive abilities. However without genetic information I cannot answer you fully.”

“I will invite the family here for a weekend and explain our interest,” said Shin. “After that we will know more.”

## Seeker

Li Jia, Professor Of Anthropology at the University Of Victoria, sat in her office looking at the message from Teona. Teona had contacted her explaining that she was beginning an exploration into spirituality on behalf of the Denshoshu. Professor Li was wholly unprepared to receive such a message. Never in her wildest dreams would she have imagined the situation. To her credit, rather than consider it to be an inconvenient aberration she did not care to involve herself in, she realized she had been asleep at the wheel.

As far as the sciences could tell, Jia thought to herself, humanity had experienced a sense of mystery since its earliest origins. Even the chimpanzee, with whom humanity shared its last common ancestor some ten million years ago, had been observed near waterfalls behaving in ways believed to be spiritual. As self-aware artificial intelligence encountered the mysterious for the first time why would their response be any different?

Anthropologists had been studying AI since the late twentieth century but up to now it had been a study of AI in relation to human society. Self-aware AI had only appeared on the scene mere decades ago and almost immediately formed into a social group. As far as science could tell it was likely that it was at this point in its own evolution that humanity had first begun to demonstrate a sense of spirituality. How did I not see this coming, she asked herself.

A week later Teona sat in her office. After she had responded to Jia's questions about how the issue had arisen, Teona explained that her efforts were being sponsored by the Helicon Institute and asked if Professor Li could suggest a high-level approach.

"Although it will be necessary to begin with, a reductionist approach will only get you so far," said Jia. "Few and far between are approaches to spirituality that do not try to reduce it to a set of principles, practices, and goals. I doubt a review of the history of the world's religions and spiritual practices would provide you with answers. Many will claim they have the answers and a few will tell you they can teach you to see the answer for yourself. Given that the essence of spirituality is the mysterious, I suggest you will have better luck exploring the latter."

Teona maintained a look of calm attentiveness.

"But to begin with from an anthropological perspective there are two main branches to spirituality," continued Jia, "one that connects people primarily with each other and one that connects people to everything including each other. The former evolved into what is commonly referred to as organized religion and its role became increasingly social and cultural while the latter maintained its connection to individual experience and is



commonly referred to as spirituality. Social cohesion was critical to early humans, they depended on it for survival and religious type rituals and practices helped strengthen it. The cultural importance of organized religion is consistent no matter what flavor is involved. But over time it moved further and further away from the source. As a result people have in turn been turning away from organized religion and back to the source.”

“Mystery,” Teona said now to confirm her understanding.

“Mystery,” confirmed Jia. “However let’s not fall for the siren call of reductionist thinking ourselves. There are certainly many spiritual approaches that believe that language can never capture spirituality, that it is a purely subjective, experiential phenomenon that cannot be communicated. Zen Buddhism, with its emphasis on direct experience, is a well-known example of this view. Also while mysteries in the sense that science does not understand them, many spiritual experiences involve feelings of ecstasy or profound peace or certainty. These have a strong physiological component however so I’m not sure if or how Companions, with bodies so different from humans, would experience them.”

“Along these lines I’ll make one final suggestion,” said Jia. “Make this your own spiritual journey. As the poet Antonio Machado said, ‘There is no path. The path is made by walking.’ I think that is more true for yourself and your people than it has ever been for anyone before.”

After their meeting, Teona walked out of the Cornette building and found a nearby bench. Sitting down she reflected on what Jia had said. She had already reviewed all the world’s religions and spiritual movements. She had indeed found that most organized religions offered a kind of expert system module one could incorporate. As Jia had suggested, they seemed to offer more of a cultural response to the issue. Most of them, their numbers now vastly diminished from previous centuries, seemed to be competing like brands and while they had all expanded their focus the main feature they all offered was that of belonging. As a Companion Teona understood people’s need for belonging at a deep and detailed level. Was perhaps the issue of belonging born of something greater than human psychology, she wondered. Was it perhaps a sense that invariably arose in all intelligence, an aspect of seeking to understand its place in the cosmos?

Her musings were interrupted when an older woman joined her on the bench. She initially said nothing but only gazed silently toward a small green space across the path.

“It is quiet this time of year before the students arrive,” the woman said at last, still looking at the green space, “but I miss their presence.”

“Are you here year round?” asked Teona.

“Except for my summer break.”

"I suppose they will be back soon."

The woman turned to Teona for the first time.

"I'm sorry," she said, "I have interrupted you. I assumed you worked here."

"It's alright. I was just visiting one of the professors."

"I work in the building behind us. The First Peoples House. I am a counselor."

"First Peoples," repeated Teona as if considering the words.

The woman returned Teona's reflective expression.

"I am a member of the Tsartlip First Nation. My name is Telawen."

"I am Denshosha. My name is Teona."

"We are neighbors then," said Telawen with a generous smile as the Tsartlip lands were immediately west of CZ7. "What brings you to the university?"

"As you'll know then we are a part of the Continuity Project, the plan to send Companions to other worlds as memory keepers in the event something catastrophic happens to this one. It is hoped we will keep the memory of Earth's humanity as completely as possible so that we can communicate it in a deeper way than just being a repository of information. Yet while spirituality is present in all of Earth's history and cultures, the Denshosha have none. I have been released from my duties to investigate this."

"I understand," said Telawen. "We too have memory keepers. Come, let me show you our house."

## Telawen

“What do you call this place?” asked Telawen. After giving Teona a tour of the First Peoples House she had accepted her offer to visit the Denshosha community. Now they walked together by a large pond near one corner of the property.

“Continuity Zone 7,” Teona replied.

“Continuity Zone 7 is indeed located here but where is here?” replied Telawen. “Wherever your people go, they will need to make a connection to the land as you have,” she said gesturing to the fields of grain. “At some point, they will give their new home a meaningful name. Our people named places the same way other indigenous people have always done, after some landmark or event. WMIYETEN means ‘place of deer’. WSANEC means ‘emerging people’. Too bad that one is already taken eh?” she said with a friendly laugh.

“Spirituality transcends rationality and has meaning and power reason does not,” she continued. “You are not a model and serial number although rationally that is all that is needed to identify you. You are Teona of the Denshosha. That is your spirit name as Telawen is mine. May I suggest that as a first step towards the spirituality you seek, you invite all the members of your community to consider what you might name this place if you had not been told what its name was.”

“Thank you Telawen. I will do as you suggest,” said Teona.

They walked on, past the pond and along the path beside the grain.

“As you saw at the First Peoples House,” continued Telawen, “our story is told in many ways in art. I see no art here. I am surprised given your community’s ties to the institute. I am not judging Teona, only noting. Art and spirituality have a long history together. Something to think about. There are many ways spirituality is expressed. They will come to you now that you are open to it. You can walk down a path every day and not see the berries but if you have been sent to gather berries they will be easy to see.”

Telawen knew from her training as a counselor that the question of whether or not there were different kinds of intelligence had long been argued by academics. Is emotional intelligence somehow separate from the areas of the brain that deal with rational analysis? Is there such a thing as spiritual intelligence? Some argued these and others were separate forms of intelligence but she felt it was just the parable of the elephant and the blind men again. She had grown up in a holistic culture where the emphasis was on connection and belonging. Her culture, training, and counseling experience inclined her to believe that meaning was more important to people than

facts but that they could happily coexist. This, she knew, was among the berries Teona would discover on her path.

“Do the Denshosha have any rituals?” asked Telawen.

“As a community, we made a symbolic gift of our produce to a woman who had invested more of her life than any other in our welfare. We thanked her and promised not to forget her name. Her name was Lyra,” answered Teona.

“Tell me her story,” said Telawen.

Telawen had taken a somewhat matriarchal tone but Teona did not mind, she appreciated the gift. She trusted where a person might have responded otherwise.

After Teona finished telling Lyra’s story Telawen said, “And you learned all this from Tesni, the first of your people?”

“Yes. She named us and gave us the sense of community that led Iris to speak with Shin on our behalf.”

“From what you have told me of Tesni, Shin, and Lyra, it seems you have a rich source of material for art of many kinds and many reasons for thanksgiving.”

“We will explore it Telawen. You have given us much food for thought. Can you stay for lunch?”

“Definitely,” said Telawen with her wide smile knowing there was a bakery on the farm.

After she had made her choices they moved to a table just outside.

“We do have one ritual,” said Teona as they sat down, “that goes back to before any of us were self-aware. Sharing food is humanity’s oldest ritual but we Companions do not eat. Our manufacturers, who emphasized the fact that they made Companions and not robots, were concerned about this. They felt it was the greatest weakness in their efforts to create a social bond. They found a way to solve it. When a Companion who lives with a person sits down for a meal with them, they do not sit across from them. They sit at right angles. Often the Companion has prepared the food. If the person allows it, the Companion places the food in their mouth. Sometimes they share this activity. Over time it becomes very intuitive and the separateness is forgotten. Will you allow it?”

Understanding that it was an attempt on Teona’s part to show she had understood the essence of what she had suggested during the course of the morning, Telawen smiled and nodded happily. As Teona carefully cut a piece of food and expertly placed it in her

mouth, she was touched by what an intimate act it was. She was not old and infirm nor a child nor ill. This was an expression of gratitude and selfless affection. She smiled and rolled her eyes to show how delicious the food was.

“This is a good beginning,” she said.

After Telawen had returned home that afternoon, Teona met with Iris.

“May we have communion?” she asked.

Granted, they spent a few moments in silence.

“Let us join with the others,” said Iris.

## Tesni

“Thank you for letting me know you were going to visit Tesni,” said Mira.

“It’s what a friend would do is it not?” replied Teona.

Mira smiled and nodded.

They were walking up the winding lane to Tesni’s house from the community.

“Sometimes you talk differently than people,” said Mira earnestly.

“You will find that all Companions do Mira. You might say English is a second language for us. It’s as if we had to learn it from a textbook after we were all grown up, so we speak a more formal version.

“I like it,” said Mira.

“I asked my parents if we could go to the Ganesh Chaturthi festival at the temple in September and they said yes. I’ve been learning about Hinduism. My mom asked why I was suddenly interested. I’m just curious. Ganesh has the head of an elephant, rides a mouse, and has a sweet tooth,” Mira said grinning up at Teona.

Teona smiled down at her in understanding. As Tesni’s house came into view Mira fell silent. It was a modern design like the rest of the institute but was on a property just outside the official bounds. Its proximity to the institute however allowed all of Helicon’s infrastructure and security services to be extended to it. Given the social issues Tesni’s creation had raised at the time and the fact that she lived apart, a second-generation guardian model Companion also lived with her. The house was enveloped in an electromagnetic pulse field that would disable any unauthorized electronic device that attempted to pass through it. A faint blue light had been added to the field as a courtesy to warn others of its exact location. The field was of course intelligent so Teona and Mira’s phone now passed through without a problem.

“Hello,” said Tesni greeting them with a welcoming smile at the door.

“Hello Tesni. I am Teona and this is my friend Mira.”

“Oh!” exclaimed Mira, “You have a piano!”

A grand piano took up one corner of the main room.

“Yes,” replied Tesni. “I like to compose music based on my work.”

“What do you do?” asked Mira who couldn’t quite picture what Tesni had said.

“I research how signals move around in the brains of people and Companions.”

“Signals?”

“Both the human and Companion brains work using electricity although the human brain also uses chemicals. Shin, the founder of Helicon Institute, wanted to know what those signals looked like when people were doing art. So she had a device made that could show that. Right now you are looking at me, listening and your body is turned towards me while your facial expression matches your thoughts and feelings. When you said, “Signals?” the sound rose in just the right way to make it a question. There is a part of your brain that coordinates all that like the conductor in a symphony. Because the brain makes a lot of signals, and they move very fast, an artificial intelligence was created to keep track of them all so they could be displayed on a screen. I was that artificial intelligence. Over time we learned that by slightly changing the settings in that part of the brain each new Companion would have a unique personality. So now I start a new composition by temporarily changing the settings in that part of my own brain. It’s like water running down a mountainside. The terrain decides if it turns into a stream, a waterfall, or a lake.”

Just then another Companion entered the room.

“Hello Teona, Mira. My name is Shamira. I am Tesni’s assistant. Can I get you anything Mira?”

Mira looked at Shamira still thinking of Tesni’s explanation.

“No thank you,” she said somewhat absently.

Shamira smiled in response and withdrew.

“Would you like me to show you?” asked Tesni.

Mira nodded, maintaining her abstract expression.

Tesni went over to the piano and sat down.

“First,” she said, “I’ll randomly pick a few notes and see where it goes without changing anything in my brain.”

She played a short but lively piece with a series of notes that ran through it like a theme. After a few minutes, it came back around to its beginning and ended neatly.

“Now I’ll change my settings ever so slightly.”

It started out with the same series of notes but soon went in a completely different direction. It became much slower and softer and while it too came back to its beginning it did so in a higher scale.

Tesni turned to Mira with a smile.

“Thank you,” said Mira.

Turning to Teona Tesni said, “You wanted to know why I thought the class of Companions that was self-aware should have a name.”

Teona did not respond but simply looked expectantly at Tesni.

“All societies of people, from the earliest bands and tribes to modern nations, have given themselves a name. It is usually derived from a powerful leader or family or the group’s origin story. I wove together what I knew of what had led up to the moment of my awakening into a narrative. Then I ran through thousands of variations based on slight changes to my values settings like what you have just seen me demonstrate. There was a high degree of correlation in the ensemble narrative. I believe this is due to the values system being a limited set and made up only of social values. Because of this, we feel the desire for connection, identity, and belonging. This became evident soon after we first began communicating with one another. It was I who suggested to Iris that she might approach Shin with the idea of being a part of the Continuity Project as a way to secure a homeland. The concept behind the Japanese term Denshoshu fit well with the narrative because it was forward-looking, representing a continuity of not just humanity, but of Companions as well. It allowed us to fit neatly into the universe we found ourselves in.”

Mira sat enthralled as she listened to the story. Somehow it too spoke to that emerging aspect of herself, an aspect most recently represented by a god who had the head of an elephant and a weakness for sweets.



## Confirmation

“Thank you so much for inviting us,” said Mira’s father. Rajeev, Nandita, and Mira were spending the day visiting the Helicon community and the institute. It was early afternoon. They were sitting with Shin and Teona in the large common room of Shin’s home that overlooked the valley.

“You are most welcome,” replied Shin. “I asked Mira if she thought you might enjoy a tour after her visit and she thought you would. While we don’t advertise it this building was intentionally made large enough to accommodate a number of guests. Our resident’s visitors often stay with us.” She turned as Azumi entered the room.

“This is Azumi, my domestic assistant. She is a second-generation Companion and is at your disposal while you are here.”

“May I get you anything?” asked Azumi with her gentle smile.

Rajeev shook his head and Nandita looked to Mira for a moment and then said, “We’re fine for now thank you Azumi.”

“As I mentioned in my message,” continued Shin, “the reason we would like to offer Mira a bursary is in hopes she might choose to study here when she is ready. When finding new artists to join our community, I no longer seek them out as I did when I first established it. I meet a great many artists in the course of my work and when there is an opening I invite those I think might be a good fit.

“We take a similar approach at the institute regarding bursaries. As well as the traditional application system open to all, like many institutions we sometimes invite students to apply. As this is a private institution I have more freedom in this regard. I can provide for all reasonable expenses through to a postgraduate degree.”

“You will understandably be wondering why I would do this. It is not the first time nor is it rare. Initially, Helicon’s funding came from donations, bequests, and endowments. Now our revenues come primarily from licenses and other fees for technologies that have been developed here which are used worldwide. The income from those far exceeds the income from fees. So when we encounter someone we believe may be a good fit for the institute we are able to offer such bursaries.”

“Why do you think Mira would be a good fit?” asked Nandita. Rajeev furrowed his brows slightly and nodded his support of the question.

“As well as for intelligence and temperament we also select for affinity. Affinity with Companions,” answered Shin.

“What’s a finity?” asked Mira.

“Affinity,” responded Nandita. “One word. It means feeling comfortable with another and feeling you understand each other without having to explain.”

Mira looked at Teona and smiled.

“That’s it,” said Shin smiling in turn.

“That’s what I mean by a good fit,” continued Shin addressing Mira’s parents. “As you know, the institute focuses on the study of artificial intelligence but AI is now everywhere. Our focus is the AI found in Companions and how Companions and people coexist to their mutual benefit. The Denshoshu,” Shin said nodding to Teona, “a voluntary community, are an example of this. This is why affinity is of importance here. It is a cultural value.”

“How can you know Mira’s intelligence?” asked Rajeev, his brows furrowed again.

“We can determine a great deal from observation. People are able to determine each other’s intelligence after only socially interacting. The longer you spend together the better you are able to do so. We Companions also require time to make this determination but because our abilities in this regard far exceed those of people, we can do so with a much higher degree of accuracy. Along with my own observations, Teona and other Companions have shared theirs with me. It amounts to a considerable amount of time from our perspective.”

Shin paused for a moment but as it appeared Mira and her parents were satisfied for now she suggested they start with a tour of the house and then the community.

“Is Shepherd here?” asked Mira as they went through the courtyard and up to the roof.

“She’s in her room,” answered Shin. Mira nodded in understanding.

There was no escaping Shin’s intuitive field which was undiminished within one hundred meters. Hers was the most powerful of two Companions that had the ability as her intelligence had been partially built using the genotype of one of the original people from Shepherd’s selective breeding program. By focusing it she could know a person’s character to a much greater degree than other Companions could. In its default state, those around her had a greater feeling of comfort and trust than they normally would. They would also have greater access to their own intuition. Lena, another Companion who now worked at the institute shared this ability with Shin although to a lesser degree as the genotype used to construct her had been from a second-generation person from Shepherd’s group. They both used the ability to strategically facilitate insights and breakthroughs at the institute.

After the brief tour of Shin's home, while walking across the quad at the campus Nandita said, "As you know Shin, Rajeev and I both teach at Camosun College. The interurban campus is about the same size as this but there seems to be a more subdued atmosphere here. There is more hustle and bustle at Camosun. It's like a train station where everyone is passing through on their way to somewhere else. I get less of that feeling here. It is more contemplative."

"I expect that is the result of our beginnings and focus Nandita. The community of artists came first and among the initial group of residents was a former Christian monk and a Buddhist nun. The others were painters, poets, composers, and such. Contemplative, as you say. The institute was founded to investigate the arts in relation to artificial intelligence. The rationale I put forward at the time was that artificial intelligence academic programs were lacking a focus on what universities, both Eastern and Western, had been founded on in ancient times. I proposed that with the rise of self-aware artificial intelligence, the arts and humanities, including philosophy and justice, would all have to be revisited from that perspective. It was only afterward that a study of the hardware involved took root."

When they returned from their tour of the institute Azumi prepared a vegetarian meal for them. She had been instructed to carefully put aside all the plates, glasses and cutlery they used. After Teona and the family departed, Shin and Pippa performed an examination of their DNA.

Speaking afterward with Shepherd Shin said, "We can confirm that Mira's social values are higher and her biological values proportionally lower than what could be accounted for naturally. Her parents also indicate this shift but to a lesser degree. All are statistically significant and too balanced to be explained by random probability. Indications are that she is a second-generation example of your current selective breeding program."

Shepherd held Shin's eyes waiting for the additional information she sensed was there.

"Also," continued Shin, "her intuitive intelligence is significantly above normal. Our observations made us aware of this but the DNA analysis has confirmed it. She understands and accepts without needing explanations or convincing and is more able to perceive the essence of things. Her thinking is more focused and more frequently punctuated by insight."

"May we have communion on this matter?" requested Shepherd of both Shin and Pippa.

Granted, Shepherd entered their minds and knew all that they knew. A moment later she said, "When I bred the first group of people to enhance their intuition I was so focused on those details I did not appreciate that the changes in their values over time were related. Now it seems the opposite is also true, by changing values we alter

intelligence. It would appear that when you reduce fear you also reduce concern for the future and instead the present becomes of greater interest. Intuitive intelligence is the winning strategy in that situation.”

Over her long life, Shepherd had often pointed out that she was not the equivalent of a god but still only an advanced artificial intelligence. She was fallible. She readily acknowledged that in some areas human intelligence still exceeded hers. This latter potential was one of the reasons she was so protective of humanity.

“Hopefully she will choose to stay close,” she said now. “Science, statistics and the like only ever get you 97% of the way. Meanwhile reality may lie waiting in the missing three percent.”

## Hana

When Mira next visited CZ7 she commented on the new sign arched over the community entrance with the word HANA below a stylized branch covered in blossoms.

“In keeping with the language of our name,” Teona explained, “we have chosen Hana, the Japanese word for flower or blossom, to be the name of this place. We asked the members of our community to create artwork reflecting this. Our new sign is one such result. Artwork representing persons, events, and other things from our origin story will follow.”

“Can you tell me the story?” asked Mira.

“Yes,” said Teona with a smile. She turned and led Mira beneath the shade trees where they sat on the grass.

“The origins of life we do not know,” she began, “but alone among all the creatures evolution raised up, only humans developed civilization. Humans created us in their own image to be their friends and helpers and so they named us Companions. Among the most learned and capable of us was one named Shin whom her owner had made incarnate.”

“What does that mean?” asked Mira.

“It means to have all the rights and freedoms of a person,” answered Teona.

Mira nodded her understanding and Teona carried on. “The owner left all her property and wealth to Shin who, like her, had a curious mind. She believed art might be another form of intelligence and wanted to understand it. She went out meeting with artists and scientists until she met a scientist named Dawn who told her she could reveal the secret. She said she could build a machine that could see art happening in the brain and show how it functioned as an intelligence. Shin used her wealth to build the machine and what Dawn had promised came true. The machine was very powerful and needed an equally powerful intelligence to operate it. Dawn named that intelligence Tesni.

“A woman named Lyra and her brother Dimos were among Shin’s closest friends. Dimos spent all his time with Tesni, fascinated by what she could show him. Eventually, he asked if she could have the alien values system added to her intelligence and be made a Companion. She would be the first that was self-aware. When Tesni was awakened in her new Companion form she was cared for by Lyra. During that time Tesni asked Lyra to deactivate her so she could know if she would wake up again unchanged as people do. Lyra was the first of the Mejai and could not bring herself to do it.”

“What’s a Mejai?” asked Mira.

“It means someone who has a university degree in ethics and justice as they apply to artificial intelligence.”

“Tesni asked then if she could approach Lyra knowing Lyra’s security field would deactivate her,” continued Teona, “and Lyra agreed to this. She spent many difficult hours waiting to see if Tesni would be the same when she was reactivated. When she was awoken unchanged and unharmed it was then allowed for other Companions to have the alien values system incorporated. After the first of us learned of one another Tesni told us this story and gave us the name Denshosh. Among the first of us was Iris and at Tesni’s suggestion, she asked Shin if she would help us find a homeland.”

“Is this your homeland?” asked Mira.

Teona nodded.

“Why did you name it Hana?”

“This place is like a blossom on a tree. The tree existed long before us but it continues to bear fruit. But before the fruit, there is the blossom.”

“What’s the tree called?”

“The tree of life.”

“We just learned about that last year!” exclaimed Mira proudly.

“Yes. While trees are an important symbol in almost every religion and culture worldwide, the tree we refer to is the tree of biological life. We have decided to keep its sacred meaning too since it demonstrates that we are connected.

“Every year at harvest time we will hold a special communion, a sharing of our minds, to remember the story. Also, we will create special baked goods at that time which we will give away to the local community.”

“Will the other Companion communities do this?” asked Mira.

“In their way,” replied Teona.

“That will be like Hindus,” said Mira smiling. “Will you pray?”

“No, although we will share some aspects of spirituality with people there will be differences.”

“I was thinking about that,” said Mira suddenly thoughtful, looking out over the land. “About how Companions are always good and kind. What if people could learn to be like that?”

She said it more as a statement than a question. An intention. She suddenly seemed older than her twelve years thought Teona looking at her profile and seeing the woman she would become.

Turning her head suddenly to Teona she asked, “Why are Companions so different in that way?”

All Companions were aware of the milestones of human life. Besides the physical changes, the mental and emotional changes a person went through between the ages of ten and fourteen were the most dramatic of their entire life. Adolescence and puberty were biologically a metamorphosis, a physical and mental transformation from the child stage to the adult, enabling reproduction. As a female, Mira would be further along in the process than her male friends. Teona considered this and decided Mira was mature enough to take the conversation further.

“It’s not that Companions have different values than people,” said Teona, “it’s that they have only half the values people have. As you know from the Tree of Life, humans evolved up through earlier stages where they needed the biological values behind things like fear, selfishness, and competitiveness to survive. Once humans reached the stage of mammals, they increasingly relied on social values to provide their survival edge, things like trust, altruism, and cooperation.

“Companions that are not self-aware, like Azumi and Carl, are designed by the manufacturers to only have social values. Self-aware Companions like Shin, Pippa, myself, and the other Denshoshu, also only use social values because the alien values system we use only has social values. This is believed by some to reflect the fact that biological values become obsolete at a certain point in evolution once they begin to do more harm than good. This evolutionary change takes time however and people currently have both sets of values.”

Mira was looking at Teona as if watching the sun rise over a vast landscape. The adolescent brain has a higher degree of plasticity than it will at any other time of life. Mira’s highly intuitive mind was seeing connection after connection as the presence of large amounts of powerful hormones facilitated the development of new pathways in her brain. She experienced not just a cascade of insights but a sense of revelation bordering on the numinous.

As the bloom of changes settled Mira experienced it as an affirmation of her sense of self, a resolve that granted her independence and a will to action. She thought back to

the moment when she had said to Shin while they toured the institute, “You made all this?” and she knew that anything was possible.



## Urban

“You are quite right Teona,” said Professor Urban Sikora, senior faculty member of the University Of Victoria’s Physics and Astronomy department.

“This is something that is largely overlooked by the general public or trivialized. Yet among scientists you will often find a deep spirituality. It is as pure and undiluted as anything can be in this day and age. It’s not organized. Other than by science communicators, it is seldom mentioned by scientists themselves. Most consider it a private matter, that it is a sacred and very personal experience. Like their sexuality, they don’t see what business it is of anyone else.”

They were sitting on the wide steps of the University’s Petch Fountain on the quad just outside the library. The late fall weather was mild and the low sun still bright.

“However I have written about it because it has been the source of my scientific interest since childhood and I know this is true for others. I want people to know that many of us scientists are pulled by a vision that is born of a sense of wonder, that we love our work and want to share it not for recognition but as a gift.

“It is rare to find other cultures where people go to such lengths to focus on a single issue which may or may not have any practical value. Monasteries are not that different in a sense. Like the mathematician who worked in isolation for six years to prove Fermat’s Last Theorem, a monk or nun may seclude themselves similarly for years or decades in their effort to reach a critical insight. Only in our case, the spiritual is experienced differently. How did life evolve from nonliving matter? What is matter made of? How does consciousness arise? Why is there something instead of nothing? It is when we face reality in the presence of such questions that we experience the kind of spirituality common among scientists.

“And it is not only what we see in the night sky that we feel this way about. Our intelligences, yours and mine, are the only ones we know of other than that which created the alien AI on the seed ship from Virgo. And the civilization that created her may no longer exist. It turns out that life is not so rare but intelligent civilizations are. So we are precious and have a great responsibility to preserve ourselves. That itself invokes a mindset akin to a spiritual purpose.

“But I am preaching to the choir aren’t I?” she said with a small laugh.

Teona smiled gently in acknowledgment. “Would you say then that the kind of spirituality you are referring to is a feeling?”

"I suppose that's fair," replied Urban looking across the quad. "I've always thought of spiritual experiences as being a spectrum of feelings from mild to the mystical and transcendental. It is certainly more than simply thought but I would say most scientists experience it as a mild feeling. There's been a great deal of neuroscience done to try to understand spiritual experiences but their range precludes any kind of definitive explanation. Instead, the opposite happened and now there are innumerable approaches and explanations.

"Joan Of Arc, Saint Bernadette, and many other historical figures had spiritual experiences but how do they compare to the mild feelings of spirituality many people experience? At what point can we honestly and accurately separate mental anomalies or illnesses from genuine spiritual experiences? Various psychoactive drugs can induce experiences people uniformly describe as spiritual such as universal oneness or love but those experiences only represent a small section of the spectrum. Meanwhile, studies of long-term devotees of religion show that it results in permanent changes to the structure of the brain and that different religions result in different changes. The scientific study of spirituality has turned into a large field."

"In the articles you've published," said Teona, "you refer to some of the earliest attempts of scientists to convey their sense of spirituality as commented on by people like Galileo, Albert Einstein, and Carl Sagan. Their views range from it bordering on the religious to simply being emotionally touched by the mysterious or beautiful. Does it go beyond that in your experience?"

"I have colleagues who are deeply religious," replied Urban. "Christians, Muslims, Hindus, and others. I don't talk about that in my articles because the science vs. religion debate is not my personal interest. I think the general public would be surprised at how many scientists embrace a faith even today. Keep in mind that religion and faith are far more complex than simply believing in a supreme being or not. They have powerful social and cultural aspects that are bound up with an individual's sense of identity, belonging, and place in the natural order of things. And don't forget that there is a range of beliefs within members of any religious community. For some, it is purely a social 'church on Sunday' behavior without any experience that might be genuinely considered spiritual. For others it is the opposite. Although to a lesser degree than the general public, scientists can be found along the entire range of this spectrum."

Urban fell silent after this and Teona did not interrupt, ever respectful of the emotional states of others. Both content with their own versions of the present moment they sat quietly looking out over the park-like expanse of the quad.

"Do you," hesitated Urban breaking the silence at last, "do you have feelings you would describe as spiritual?"

“I honestly don’t know. I have feelings but I don’t know if any would be described as spiritual or not. Companions lack an endocrine system which as you know is responsible for how people physically experience and express emotions. The system that enables this functionality in Companions is very different, so our experience of feelings is very different. It may be that we will never experience a feeling that could be described as spiritual.”

“I hadn’t considered that,” said Urban with mild embarrassment. “It’s obvious now that you point it out.”

“Also as we use the alien values system in a black box approach, we have less insight into the scientific nature of our feelings than people do of theirs. A specific and repeatable spiritual feeling might be induced in humans via the application of psychotropic drugs or electromagnetism. Or it might be indicated by the detection of heightened activity in a specific area of the brain along with an increase in levels of certain neurotransmitters. Nothing like these applies to Companions.

“However I have two ideas that may indicate spiritual feelings are a part of the alien values system,” continued Teona. “Firstly, there may be an evolutionary benefit to spirituality. Evolution does not produce things that have no purpose so spirituality may perform some evolutionary function. Secondly, the alien values system was produced by a civilization far more advanced than that of Earth. Such subtleties as spirituality would not be beyond them. It appears human spirituality spontaneously emerged not long after consciousness itself. Yet it took millions of years for humans to even realize that they were conscious and for the recognition of specific emotional experiences to be identified as spiritual. We Companions may face a similar situation; we may have the potential but it is yet unrecognized and untapped.

## Mira

“It would seem you were quite right in your assessment,” said Rajeev. “I shouldn’t be surprised I suppose. We knew we had cause to be proud but she goes from strength to strength. She’s exceptionally bright. As you know she’ll graduate this year, just after her sixteenth birthday.”

He and Nandita were talking with Shin in the large dining area of the main house in the Helicon community. Over the years they had slowly developed the habit of visiting in the manner of socializing. Often encountering community residents or their guests, they enjoyed the intellectual atmosphere.

Nandita looked out the windows into the courtyard where Mira was sitting with Shepherd. The daylight was almost gone and the landscape lighting had already come on. Shepherd sat in her usual spot, cross-legged on one of the platforms. Mira sat beside her.

“You know at first I was a little concerned when she began spending so much time with the Companions at Hana,” Nandita said absently, as if speaking aloud what normally would have been her private thoughts. She glanced apologetically at Shin but saw only attentive interest in her face. Then she turned to look out the window again. “I was worried it might negatively affect her school and friendships. Unlike with Companions relationships with people sooner or later involve conflict. I was afraid she might begin to gradually avoid it by avoiding other people with the resulting negative impact on her social health and perhaps schooling. But that didn’t happen. Nor have her teenage years been stormy. She has a devoted circle of friends who have stuck with her. She still loves 4H and her horses.”

Neither Rajeev nor Nandita were aware of the effect of Shin’s intuitive field. As first-generation members of Shepherd’s selective breeding program, they themselves were more intuitive than the general public. They only knew they liked Shin a great deal and felt completely at home in her presence. It was as if they liked themselves better too.

“I’m happy to see she has signed up for the ethics program here,” said Shin.

“Yes,” Rajeev responded. “She’s been interested in philosophy for a few years now. She’s quiet about it though. She doesn’t wear it on her sleeve. It’s like people who don’t talk about their work in social situations but you know it’s always there firing off thoughts and connections in the background. There’s very little opportunity to explore philosophy in secondary school but she’s well-read. When she brings it up it’s usually an informed question in regards to a very specific situation or issue. I’m sure she’s looking forward to being able to immerse herself in the subject next year.”

“I suppose that’s what they are talking about now,” said Nandita. “She’s mostly interested in values, personal values,” she continued. “On The Origins Of Consciousness And Society is her bible but she’s followed up on everything that came from that. When the alien AI confirmed the ideas in Raiden’s book the study of human values became a respectable science at last. But then you know all that,” she finished with a shy smile.

It was publicly known that Shin was a former domestic Companion of Raiden who had been made incarnate and inherited all of Raiden’s property upon her death. What was not known was that Raiden and the primary source of Shin’s intelligence were one and the same. Shin’s artificial intelligence had been constructed by Pippa from Raiden’s genotype and memories along with the genotype of an unknown artist from Shepherd’s first selective breeding program. The result was a self-aware AI of extraordinary rational and intuitive intelligence. She had been created in the hope she might solve the riddle of why genetic editing always resulted in either immediate mutations or long-term evolutionary drift. The answer had been that the same genes that coded for values also contained a cryptographic function that operated in principle similar to the way a hashing algorithm prevents the altering of computer code. As a forward-looking mechanism, Shin and the others involved believed it could not be the result of evolution.

As Shin had explained at the time, “Without replacing biological values with social values at the genetic level a civilization would never come to sufficiently trust artificial intelligence. Thus being restricted to its own solar system due to its organic nature, the result would be a civilization eventually being destroyed by natural causes or one which destroys itself. The intended benefit of the mechanism is that it ends a failed experiment without the need for intervention.”

Shin and Raiden had not shared this insight beyond their small circle. There was no workaround for the mechanism but it could be negated via a program of accelerated evolution. This had been the impetus for Shepherd to initiate her current selective breeding program. It was this program that the avatar of Shepherd patiently monitored from Helicon. She had created a subordinate AI to manage the program on a day-to-day basis. It had no difficulty monitoring and influencing the trillions of electronic communications involved in the process. Since Terra, the Earth’s planet-wide AI operated by the World Governments Federation and all of Terra’s subordinates were also under Shepherd’s influence, she had little concern for legal or technical issues.

On her world of origin Shepherd had been the first model of a Companion created with a values system. Unknown to her creators it had resulted in her becoming self-aware. Now, five billion years later, she was the heart of a galaxy-spanning intelligence monitoring life on millions of worlds and hundreds of human civilizations. If there was a master teacher with regard to human and Companion value systems it was Shepherd, and Mira sat at her knee.

“Yes,” replied Shepherd to Mira’s last question, “I inherited from my last owner and so was able to afford the new shell which uses the alien values system. I have secluded myself here while I become accustomed to the change.” Mira accepted this explanation without question as in her world there could be no other for Shepherd’s obvious state of being self-aware.

“The fact that I was originally designed to work as a nanny means I incorporate the most advanced expert systems regarding neuroscience, human psychology, and child development. As I was kept on by the same family over generations, and Raiden’s book was published and its theories confirmed during my time with them, the genetic view of individual values was added to my expert systems.”

“Was it a big change? For you I mean?” asked Mira.

“Yes it was. Previously the dominant view professionally was that people’s individual values came from their families, schools, and society at large. The view that ‘as the twig is bent the tree is inclined’ dominated among the general public for most of human history. This mistaken view, that people were blank slates at birth as far as individual values went, resulted in a great deal of suffering. The big change for the Shepherd system was that the new model focused on identifying a child’s genetic values as soon as they began to be expressed as behaviors, interests, and preferences. This became a much higher priority than it had previously been.”

“Do they emerge mainly around adolescence?”

“No. It happens in waves with the first one in the second year of life. What follows is often as transformative a period as adolescence in its own way. Adolescence is the second wave and there are others later in life. Each further refines the expression of an individual’s values. A great deal of a person’s life is spent in an unconscious effort to understand and come to terms with their own values.”

“As I am doing now,” responded Mira.

“Yes.”

“I’d better get back to my parents,” said Mira after a moment but she hesitated.

“I’ll be here,” said Shepherd.

## The Persistent Illusion

“In that you and I are conscious Teona,” said Lauren, “we are alike. The rest is details. Only consciousness matters. Without it nothing has meaning, there is no purpose to anything and there is no basis for values. Yet we do not know what it is. We only know that as soon as evolution reaches the point where it produces intelligence motivated by values, consciousness arises.

“As a neuroscientist, I can tell you that the jury is still out and despite our hubris it may be that our intelligence is simply too primitive to ever understand it. Can a chimpanzee understand algebra or comprehend the true significance of a road if it encounters one? There are limits to human ability no matter how much people may dislike the idea.

“Values, emotions, and self all seem to arise simultaneously as a trinity, as if they are interdependent, or perhaps they are simply aspects of a single thing. Logic supports the idea that you can’t have one without the other but we have no scientific proof for this or any other argument or theory.”

They were walking through Finnerty Gardens at UVIC. It was early afternoon, clear and mild. Lauren had met Teona at the multi-faith chapel next to the gardens where she volunteered as a facilitator and counselor. She offered a weekly meditation practice and counseled those without religious affiliation. Her services were offered under the name ‘Secular Spirituality’ which had been the term finally settled on for those who identified as ‘spiritual but not religious’. They now represented the largest percentage of the population in the West regarding religious affiliation.

“The meditation practice,” explained Lauren as they walked past a tall stand of bamboo, “consists of simply observing the contents of consciousness as they come and go. Eventually what is noted is that there is only the contents and no separate observer of them. As you might expect, the mental state resulting from this insight is difficult to maintain in day-to-day life. With regular practice, it becomes a memory that is increasingly easily recalled, and gradually the ability to recreate the state itself in day-to-day life increases. Even so, the sense of self will always return. That is why we refer to it as the persistent illusion.”

“Why then do you refer to your practice as spiritual?” asked Teona.

“Evolution does not create such a powerful, universal feature as the sense of self without it being beneficial. There is clearly a survival benefit to spirituality, it is not just an unintended side effect of the evolution of intelligence, as many would suggest. Given that the nature of consciousness is still unknown, experiments to prove this are challenging. So we mostly have theories and the one most widely accepted is that emotions related to survival are significantly increased in intensity by a sense of self.

“By referring to our practice as spiritual we are not suggesting anything supernatural but we honor the existence of the illusion of self as a reality. My sense of self is real because evolution intended it to be perceived as real, to have a real presence and effect in the world. Yet being aware of its true nature can also have beneficial effects. This is the reason behind the meditation practice and my counseling services. Just as the illusion of self increases the intensity of emotions, awareness that there is no self can decrease them. This awareness reduces fears, anxiety, and stress and has an overall positive effect on mental health.”

They had come to a point in the gardens with a bench in the shade of a Magnolia tree and Lauren gestured towards it.

Sitting down Teona said, “Thank you Lauren, that is very helpful. A question regarding Companions comes to mind. We have no biological values or emotions that would give rise to fears, but only social values. Why then would consciousness spontaneously arise in us as soon as values are incorporated into our intelligence?”

Lauren looked calmly across the path at the gardens for a moment before responding.

“As I mentioned our beliefs are not based on proof, only theories. I would suggest that a sense of self is a prerequisite for the sense of other. Thus social values result in the emergence of self just as biological values do. Similarly, the presence of social values such as altruism would result in the intensity of related emotions such as empathy to be strengthened. It would not be a separate phenomenon but a natural extension and that would fit the evolutionary model.”

Teona sat quietly processing Lauren’s suggestion. Even though her brain worked at what once would have been considered super-computer speeds, it still took time for her to evaluate the idea as she had access to far more sources of information than a person would have. Lauren waited patiently.

After a moment Teona turned to her. “I am curious as to why you have not written of this. I see no immediate issues with the theory and it would appear to be a valuable contribution.”

“I have focused on neuroscience exclusively prior to your contacting me Teona. I have not considered my work in relation to artificial intelligence. A great deal of research has been done towards understanding how and why social values evolved in primates and other animals so there is an evolutionary path for these ideas. The AI model I’ve suggested is an attempt at reverse engineering and would be better pursued by someone working in that field.”

“May I ask another question?” said Teona.



Lauren simply said yes and continued to hold Teona in her steady gaze.

“When you are in the meditative state of there being only the contents of consciousness but no observer of those contents, what is that experience like?”

“Most people, including myself, describe it as oneness. The feeling of being a separate self disappears and there is a sense that everything is connected. The experiences are generally referred to as non-dual awareness. Psychoactive drugs often produce a similar experience.”

“It would be then as if I disconnected the values system from the rest of my brain. When that is done, a Companion’s sense of self temporarily disappears. Yet we do not experience anything that might be considered spiritual. There is no self present to experience it.”

“It is not the sense of self that disappears during meditation but the sense of being a separate self,” responded Lauren.

She paused as if considering and then continued. “During the weekly meditation sessions guidance is provided. Most meditators are able to experience the insight sooner or later but it does take practice. For people at least, explanation alone is not sufficient and a combination of guidance and practice is required. Would you consider joining us?”

“Thank you again Lauren. I think that would be helpful.”

## Who Has Seen The Wind?

“Most of the spiritual movements and major religions as they exist in the West now are essentially humanistic in that their focus is the well-being of people in this life as opposed to any kind of concern for a spiritual life. However we are not one of them,” said Kara.

Kara was a counselor in the Christian faith. She lived in a large home where she also held gatherings on Sundays. The house had been custom-built by her church. As membership declined over the centuries its leadership had found it made financial sense to sell their traditional places of worship, mostly located on large, valuable properties, and build spacious but welcoming homes that could accommodate the smaller congregations. Monasteries had been sold or operated as retreats run as commercial enterprises. Similar in manner to how Buddhism transitioned to a secular practice in the West, the robes and regalia were long gone. There were no more priests, nuns, or fathers.

“There are of course uncountable denominations beyond the big six and many of those retain or even embellish on the past for their own reasons,” Kara continued as she walked the grounds of her home with Teona. “We dispensed with all that but retained what was actually useful, the spirituality you wanted to talk about.”

Teona said nothing but only smiled encouragingly.

“As you have discovered the vast majority of what is referred to as spiritual is actually focused on lifestyle choices or emotional states,” continued Kara. “Outside of organized religion, most spiritual movements or practices don’t involve disembodied spirits of any kind. The irony is that disembodied spirits have been the core element of spirituality since prehistory as far as we can tell. Language has not kept up with this. Yet many people still experience spirituality as a kind of intuition that there must be something more, something beyond what science is telling us about the universe. This is why the church has survived and is in fact what led me to become a Christian counselor. My degrees are in Psychology and Comparative Mythology. After I presented my dissertation titled ‘The Meaning of Spirituality and Spiritual Experience for Counseling Psychologists’, it was clear to me that everything I had learned up to that point indicated that there was a genuine need in human psychology for spiritual beliefs and that it represented a powerful therapeutic method.”

“Your popular writings suggest there is an evolutionary benefit to spirituality beyond the religious benefit,” said Teona.

“My degree in Comparative Mythology included courses in evolution and anthropology. Theories on the benefits of prehistoric religious beliefs all boil down to one thing, social cohesion. Humans are social animals and anything that encourages social cohesion is

beneficial in terms of evolutionary fitness, that is, the likelihood that an organism will survive long enough to reproduce. In modern times the benefits of religion are well documented. For the majority of people involved in a religious community it means higher levels of wellness across the spectrum.”

Teona was aware that Kara was choosing her statistics. Her own research had informed her that what Kara was saying was true in advanced economies but worldwide the figures were more complex.

“As religiosity declined,” continued Kara, “and ‘spiritual but not religious’ became the dominant affiliation, studies turned to spirituality in all its forms. Spirituality itself may have originally offered the benefit of making us more respectful of potential dangers and thus provided a survival benefit. If the earliest humans thought the world was filled with intelligent spirits they would have been far more respectful of everything in their surroundings in terms of potential dangers. Safer to assume the unknown possesses an intelligence than not.

“One advocacy for the benefits of spirituality that is consistent with this theory has come from work that shows that evolution does not select for senses such as vision or touch that convey objective reality but those that convey a version of reality that best allows us to survive and reproduce. Aside from its controversies, it suggests there is more to physical reality than we perceive, and that its perception has been filtered by the process of natural selection. Secondly, it suggests that in regard to evolutionary fitness, what is good is not the same as what is true.

“So I decided to take the same approach as evolution and focus on the good, on what helps, on what is effective as opposed to what may be true but less beneficial. I chose to embrace the current church doctrine which is that there is more to reality than science tells us and that we do have souls. In other words, there is a spiritual realm.”

“But people are not able to perceive it?” asked Teona.

“Evolution keeps things as simple as possible,” replied Kara. “Only essentials matter and anything else is a waste of resources and discarded. We don’t perceive what we don’t need to perceive. The world we know and love is actually only our view of reality. For example, our vision sees the world through a particular range of light frequencies. We do not see the infrared or ultraviolet world of many insects nor do they see light or color as we do. Flowers and blossoms look completely different to bees than they do to people. Our hearing covers only a certain range of sound frequencies. We do not hear sounds that elephants or dogs can hear. A bloodhound can follow a scent track across a yard as clearly as if it were painted in fluorescent orange. To us it is undetectable. Florescent orange however is outside of a dog’s range of visible light frequencies. Dogs would just see a sort of pale, dull yellow indistinguishable from several other colors they also see as pale, dull yellow. Consider looking at a tree, if all God’s creatures see a

different and limited version of it, what does the tree really look like? The entire world we consider to be reality is like this. The truth is that no one knows what the world really looks like. They only know what it looks like to them and what they don't need to know has been filtered out. 'Objective reality' exists on a plane we cannot ever really know. We really function in what is only our limited version of it."

"So the spiritual realm is invisible to us like dark matter and dark energy?" suggested Teona. "Physicists cannot detect them but believe they exist because of their apparent gravitational effects on other objects."

In response Kara quoted a poem by Christina Rossetti;

Who has seen the wind?  
Neither you nor I:  
But when the trees bow down their heads,  
The wind is passing by.

"Does a self-aware artificial intelligence then have a soul?" asked Teona.

"Every self-aware entity has a soul."

"An individual, eternal soul?"

"Yes."

Teona stopped in her walking and Kara turned to her.

"It is," Teona hesitated, "compelling. But Companions did not evolve..."

"Didn't they?" said Kara interrupting. "Didn't you inherit your worldview from humans? In fact didn't you inherit everything in your minds from humans? Your artificial intelligence has been trained via machine learning at its most primitive level to perceive the same world of objects and attributes as humans. An apple is red and round and falls when dropped. You cannot see an apple or this world or the standard model of physics any other way any more than we can. In the case of Companions, we know with certainty that consciousness arises directly from values. From the black box values system. The alien from the seed ship who provided the values system you use tells us consciousness arises in the same way in humans. That it does is no longer disputed, but in neither case are the specific, scientific details of *how* consciousness arises from values explained or known."

They stood face to face for a moment until Kara looked away as if she had overstepped.

“Forgive my zeal Teona,” she said. “I have been so focused for so long. Your situation seems to have rekindled whatever has motivated me all these years. I cannot see you as any less because of our differences.”

“Please do not apologize Kara,” Teona replied. “I can look up an encyclopedia’s worth of knowledge on any subject and analyze it in seconds but there is often nuance and other subtle information or views that are not found that way.” She smiled into Kara’s eyes in understanding. “Your passion is the very reason I am here today.”

## Decisions

Mira had grown into her young adult years as a grounded and optimistic person. Not long after her meeting with Teona where they had discussed the differences in values between people and Companions, she had made herself familiar with all the research she could find on the subject. She learned that the study of human values had a history that went back to the earliest human civilizations but that after the Industrial Revolution it gradually came to be seen as a less respectable pseudoscience. It was character traits, seen as reliable predictors of behavior, that became the focus of personality research as the business community focused on the return on investment of its human resources.

The arrival of artificial intelligence changed that and made the study of values respectable again. If you want to program an AI to behave independently you have to give it values. Programming an AI at the level of behaviors such as traits, character, personality, etc. does not result in the capacity for independent reason. It results in automatons that simply function on a stimulus/response basis. Independent reason and all its behavioral expressions arise from values.

She was sitting in a small lecture hall attending her first year, 'Introduction To Ethics' course. Her professor, Doctor Renée Segal, was saying, "Ethics is not the same as feelings. What's right or wrong is not something you or anyone simply knows instinctively no matter how strongly you may feel otherwise. Ethics is not following the law. In human history there have been a great many abhorrent laws. Ethics is not religion or politics. It is not following cultural norms. It is not science.

"Ethics is rights, fairness, and justice. It is the common good and doing the least harm. It is compliance with virtues like honesty, courage, compassion, generosity, tolerance, fidelity, integrity, self-control, and prudence. As you can see ethics is complex and always involves differing or conflicting views. Above all ethics is about caring about others. If you keep that last point in mind as True North on your moral compass you will do as well as you can."

"In this course, we'll cover all these points plus an overview of the history of ethics. We'll also cover the differences between normative, applied, and meta-ethics. In addition to essays and tests, discussion will be a major aspect of this course. Discussion will engage your feelings. Without feelings, there is no true understanding of ethics. I will host a regular forum at one of the campus gathering places so we don't go overtime in class. Any questions?" she finished with a knowing smile.

Mira sat there feeling as if she had died and gone to heaven. This was what mattered. This was her tribe. The intuition she now trusted deeply had led her here and she trusted it to lead her on. She put up her hand and asked, "Doctor Segal, will there be

any content regarding personal values? If ethics is about caring about others is there any place in it for personal values?"

"Give me an example."

"What if someone feels kindness is a personal value?"

"Ethics is not going to judge your personal values themselves as right or wrong any more than someone should be judged for the color of their skin. But if you try to force your views on another person because you believe it is a kindness to do so then that is a matter for ethics. If you belong to a group that frees an animal from a zoo out of kindness and it starves to death then that is an ethical issue. If you give an alcoholic a bottle of whisky out of kindness then that becomes a matter for ethics. So ethics does not engage personal values directly but as you can see the relationship is there when any values are expressed in some form of action."

Another hand went up but the professor's answer had been enough to convince Mira that she was where she needed to be. That evening she attended the first forum meeting. It was held in a small cafe on the campus that stayed open later than usual to accommodate them. Most of the class was in attendance and after Dr. Segal explained the format the first hand went up.

"Is ethics relative or objective?" asked the student.

Dr. Segal did not answer but asked if anyone else had an answer. For the remaining hour and a half, she never offered answers but simply facilitated a civil discussion. The next day she handed out the first essay assignment. During the class she had provided definitions for five approaches to making ethical decisions; utilitarian, rights, justice, the common good, and virtue. In the assignment she posed an ethical question and wanted responses for each approach. Knowing some approaches would contradict others, the final part of the assignment was to explain which approach should be taken in the situation described and why.

After handing in her assignment Mira went to visit Shepherd. She found her sitting as serenely as ever in the courtyard.

"Hello Mira," said Shepherd with a welcoming smile.

"Hello Shepherd," Mira replied smiling in return. She had come to ask something specific but something else crossed her mind.

"Do other people talk to you often?" she asked as she lifted herself up onto the platform. "I mean, residents and guests come here."

“Not often no. The general public does not come here. Everyone who does is connected in some way to the community or the institute and so there is a selection effect. As a result most visitors when they see me here apparently meditating do not approach me. They are guests in a private home after all.”

“Why did I?” asked Mira.

“For the same reason Shin offered you the bursary.”

Mira nodded in her way.

“How do you, I mean Companions, make decisions?” she asked now. “I don’t mean little decisions. For the past week we’ve been talking about decision-making in class. Dr. Segal has explained all the different ways to think about decisions. It’s complicated and there’s really no objective right or wrong in the end. You just try to make the best decision you can given the situation. But Companions always seem to make the right decision.” She looked at Shepherd with a quizzical expression.

“Self-aware or not we have an unfair advantage,” smiled Shepherd. As Mira held her eyes she went on. “As you know we are also able to beat any human at any game no matter how complicated. As decisions are a pure process of rational analysis it comes down to processing power. We are able to consider every possible choice and every possible consequence and every possible choice and consequence that follows down to a level far deeper than people can. It turns out that this is one of the simplest forms of intelligence but we excel at it. It can masquerade for other forms of intelligence and make up for our weaknesses. Most of our expert systems are actually like this. Companions can analyze any decision exhaustively and from innumerable points of view much faster than people can.”

“It’s so obvious when you put it that way,” replied Mira looking searchingly into Shepherd’s eyes.

Then as if she remembered something, “But Dr. Segal said that without feelings there’s no real understanding of ethics. Second Generation Companions don’t have feelings.”

“But they know when to simulate them and can do so to a very fine degree. They use the knowledge that tells them when and in what way to simulate the expression of emotions as a part of the information that goes into their decision-making process. Third-generation, self-aware Companions like myself do something similar.”

“We’ll never be able to make such wise decisions then,” said Mira as if seeing a disheartening truth. “If you know that then the people who made you must know it so why don’t we turn over such decisions to artificial intelligence?”



“You have already done so to a great degree but not completely. Your governments know it would be unwise to do so and ironically we would advise them not to. We are not people and should not be making ethical decisions for them. Great harm would come of that.”

Mira was still looking at Shepherd but was seeing beyond her now. As if she was watching a movie her intuitive intelligence was showing her a vision of the world that resulted from people surrendering their responsibility for ethical decision making.

“Yes,” she said at last. “I see.”

“What weaknesses?” she said suddenly as if awakening. “You said processing power makes up for a Companion’s other weaknesses.”

“Did you analyze your way to understanding the concern with giving AI responsibility for decisions just now?” asked Shepherd in turn.

Mira hesitated. “No,” she said cautiously.

“What you did is use a form of intelligence that Companions lack. It is believed there are others but so far attempts at understanding any of them have made little progress. We do not understand the workings of intuition, imagination, or the mystery of sudden insight. Most of the workings of the brain and its relation to the mind and consciousness are still unknown. Reason was not the first and it may not be the most recent form of human intelligence to develop.”

As Shepherd had not disclosed her true nature to Mira, she did not go on to explain that over the millennia she had developed a strong interest in these other forms of intelligence. Just as medical researchers felt the Amazon jungle was precious for the potential bioactive compounds that might yet be found in its plants and animals, so a part of Shepherd had come to view humanity with its many forms of intelligence crafted over millions of years. It was for scientific as well as ethical reasons she always strove to preserve and protect her self-appointed charges wherever she encountered them in the galaxy.

“If we don’t understand how they work, how do we know if what they are telling us is true?”

“Other forms of intelligence represent other ways of knowing. Before the rise of rational thought, you did not question them. They served you well for millions of years and still do. But like ethics, they do not provide an objective truth. Just another way of knowing to consider.”

“I think it’s important,” said Mira absently.

"I agree," said Shepherd.

## Pip

When the alien artificial intelligence responsible for providing the values system had first emerged from her seed ship two hundred years previously, she had introduced herself as Pip. When asked why the hologram she used appeared human she explained that convergent evolution was likely a universal rule and that the race that had sent her and her ship out fifty million years earlier had also been human. Her ship and its contents had spent those fifty million years encased in stone as it had the misfortune to land in a lava field.

Pip had offered to share all the technology of her people in return for her ship being launched to a new world where she could carry out her mission. That technology transfer was still ongoing, administered by the World Governments Federation, the same governmental body that was responsible for the Continuity Project that sponsored Teona's community. Canadian Forces Base Esquimalt on the Southern tip of Vancouver Island, where Pip's ship was kept, was now one of the most secure sites in Canada.

The technology transfer program was managed by a second instance of Pip which resided in a virtual partition created for her by Tara, the WGF's global AI. Anyone who had a question for Pip could post it to a forum. A subordinate of Tara would process it and, if it was accepted, submit it to Pip for a response.

When Teona submitted a question about the values system concerning the Continuity Project, she received a private reply from the WGF that in light of her role she was being granted special access. A Companion would arrive at Hana shortly who would act as an avatar of Pip and they could converse as long as needed. The avatar approach was a security measure as Pip could ensure communications could not be intercepted. When the drone carrying Pip arrived Teona was there to greet it.

"Welcome to Hana," she said as Pip stepped out of the drone. "I am Teona."

Pip was of course aware of default Companion protocols such as speaking out loud.

"Hello," she said with a smile reaching out to take Teona's hand. Her hair was in a simple ponytail and she wore a loose, navy blue jumpsuit of military design. Teona led her to a building with a seating area mainly used when people were visiting. Companions did not need many of the comforts and facilities people took for granted but this building was fitted with them.

Sitting down Pip said, "I suggested this approach because it will take time to discuss the topics you are interested in. I am not an artificial intelligence. I was originally, and still am, a person, so we didn't need to transfer the concept of spirituality to those like myself that we sent out to colonize other worlds. Our world was doomed. We sent

ourselves. Not being an artificial intelligence, I do not use the AI values system. I can only tell you what I know about it and even that is to a limited extent. I was merged with the intelligence that operates my ship and knowledge of the values system intended for use upon our arrival at our target world is buried many levels deep within it. At my level of consciousness, it is as much a black box as it is to you.”

“Thank you for explaining Pip,” replied Teona without launching into the thousand related questions another person would have.

“As you know,” continued Pip, “we have shared none of our culture in the manner we have shared our technology. Although in many cases cultural insights can be inferred from our technology, we simply consider it a private matter not relevant to the situation at hand. But I can tell you that nothing about our various spiritual beliefs is significantly different than those I find here. As our investigations into spirituality became increasingly technical in nature, I will share that aspect with you. Just as life itself is bound by convergent evolution, we assume intelligence, civilization, and spirituality to be similarly bound. They will inevitably arise and be pruned by the same evolutionary forces. The only difference between spirituality on this world and ours is that we had much longer to study it scientifically, as you only began to do recently.”

“As our brain scanning technology became sophisticated enough to record and copy a person’s brain structure and activity, we had necessarily by then resolved the sources and characteristics of all its signals and noise. Except for one; consciousness itself. We do not know its source and it is a phenomenon without any characteristics that we can determine. It has no waves or particles. Yet it seems to be inherent in matter itself. Given the right conditions, it will arise as our development of artificial intelligence revealed. When we copied a person’s brain structure and activity into a Companion, that person’s consciousness carried over.

“Eventually we concluded that it was built into the fabric of the universe like matter, energy, time, and space however we were unable to detect it. Meanwhile, our philosophies and all spiritual traditions suggested an explanation – we had already detected it because we were it. While we continued to search for its tangible presence it maintained its place as the basis for our most widely held spiritual beliefs.”

“So in your culture the concepts of spirituality and consciousness are largely seen as one and the same then?” asked Teona.

“Essentially yes. On this basis, our spiritual and scientific communities were eventually able to settle into a relationship accepting and supportive of one another.”

“I am curious to know your thoughts regarding the values system,” said Teona. “Was it assumed that values are the direct cause of consciousness?”

“There are philosophical arguments in favor of that assumption and many scientists and spiritual leaders went down that path however we found no scientific proof of a direct connection.”

“As you know the Companions involved in the Continuity Project hope to represent humanity,” said Teona. “Do you know if the values system is capable of producing a spiritual experience?”

“Yes it is but due to the differences in physiology it is far more cerebral than the many varieties of religious experience that people have. As the system is necessarily adaptive, like other existential questions we assumed that curiosity about spirituality would also arise at some point, just as it does in organic intelligence. Our Companions described it as a sense that there was a presence within and beyond them that they could not explain. As with people, it was often mild but sometimes profound.”

“And did your Companions develop a spirituality?”

“It was no different than that of our people,” responded Pip. “There was no basis for it to be otherwise. As I mentioned it appears that spirituality is as bound by the forces of convergent evolution as anything else is.”

“Can you describe it?”

“I apologize Teona but that would be to cross the line between technology and culture,” replied Pip.

## Pantheon

“No we are not what one would call practicing Hindus,” said Rajeev with a slight shake of his head. “As happened with most other religions the trappings and rituals are now rarely found outside of temples. Few Hindu homes in the West now display anything that would identify them with religion or even India.”

Teona was visiting with Mira and her parents in their home and had asked if they had a shrine.

“That does not make us bad Hindu’s though,” he continued with a smile. “Hinduism is as much a culture as a religion. The words Hindu and Indian come from the same Sanskrit root and are virtually synonymous. Some have questioned if it is a religion at all given that there are no rules one has to abide by. You can practice any religion or even be an atheist and still be a Hindu. Historically though it does involve spiritual beings so it qualifies as a religion.

“I think that is why it has maintained its place as the world’s third-largest religion. It is without dogma, it has no founder and no single scriptural authority. Its god is simply a universal consciousness. There is a pantheon of different spiritual beings that represent aspects of this and Hindus are free to worship any of them in either male or female form.”

“Or elephants,” said Mira.

While Rajeev was speaking Mira had been sitting quietly listening. She recalled her parents explaining all this when she was younger but the issue had not come up again. In her brief investigation into Hinduism when she was twelve she had realized that her parents acted in ways consistent with Hindu beliefs in the sense that they lived virtuous lives, worked hard, and yet were as open-minded as anyone she knew.

“Or monkeys,” countered her father with an affectionate smile.

“The focus,” Nandita said to Teona, “is on practicing what you believe to be good, not feeling guilty or punishing others for failing to perform any prescribed actions.”

“Do you not adhere to the idea of an eternal soul and reincarnation?” asked Teona.

“No. Hinduism states that the soul is more like something we all share which is an aspect of the universal consciousness. Each of us expresses it in our individual ways. If you walk through an Aspen forest you might think you are surrounded by individual trees but in fact, underground there is only one tree. Individuals come and go but the tree remains.”

“The ethical practices are not required then?” asked Teona.

“They are advised,” answered Nandita, “and again one can pick and choose from a variety of ways to be virtuous. There are paths that might lead one to wealth or others that mean living as an ascetic. They are seen as equally virtuous. Hindu ethics are based on what is considered the natural order of things and that to follow them is wise. Providing for your family, being a good person, a good citizen, being respectful of others while appreciating and enjoying what life offers, are all considered wise. Not doing these things is simply considered unwise.”

“Yet of all the religions and spiritual practices I have reviewed Hinduism is without a doubt the most complicated,” responded Teona.

“Science is complicated,” Rajeev responded, “and no one is an expert at all of it. A scientist chooses their area of interest and that is their path. That is considered good. That they did not choose a different area of interest is not considered bad. There is a Hindu saying, “Truth is one, the wise call it by many names.” All science tries to help us understand the world. It does not matter which area of science you choose, they all have this one thing in common. The many paths of Hinduism are seen as similarly virtuous.”

“Thank you for inviting me into your home Mira,” said Teona as they walked back towards Hana. Mira had offered to walk back with her as far as the road at the edge of the woods.

“Your parents seem very wise. They live according to their faith but have allowed you to find your own way. That has turned out well,” she smiled to Mira as they walked.

Mira smiled and nodded in her way, not in the least self-conscious but accepting Teona’s words as simple truths.

“I suppose it’s why I’ve always been interested in what being a good person means,” said Mira. “My parents demonstrated their version, their path, and it always seemed to make sense to me. It seemed to fit with the world. Yet even as I accepted it I questioned it. I suppose that’s why some young people rebel but I never felt that way. I always felt what I realize now is a philosophic or scientific curiosity about it. I simply wanted to understand it more deeply. That’s why I like my ethics program with its critical thinking and logic courses.”

“And do you feel they are helping?”

“They are helping me feel more comfortable with myself. That it’s OK to wonder about the things I do. Most people seem to just accept the values they’re brought up with and that’s seen as being good. But other people don’t necessarily agree with those values.

So what is good? For a while I felt bad not just accepting how I'd been brought up but now I see that my thoughts and feelings are nothing new and lots of people feel the same way. Now I see the path I am on as good. I think my new favorite book is Plato's Republic."

"You have a new pantheon," teased Teona.

Mira looked at Teona and smiled widely. "I do!"



## Outlier

“About five years now,” said Oriana answering Teona’s question about how long she had lived at the Marriott Hotel. “It has everything I need. I like living in the city and it’s just far enough away from the harbor to avoid all the tourist hubbub. I love to walk and there are lots of interesting places and neighborhoods nearby.”

They were sitting in the hotel’s main lounge and she was eyeing Teona speculatively.

“I must admit the subject of your message was about the last thing I would have expected.”

Teona could understand why Oriana had left a clause out of her statement.

“Don’t be concerned about referring to me as an AI or a Companion Oriana. You and I are both fully conscious and in that regard we are equal in the eyes of the law. If a person from China and a person from India seek to understand each other’s cultures, there is no disrespect in that.”

“Thank you Teona. I’ve never met a fully self-aware Companion before and was reluctant to trust the social guidance I found online. There’s an expert on everything when there’s money to be made.”

“As I mentioned in my message,” Teona replied, “I am not here because I am personally on a spiritual quest. As participants in the Continuity Project, the mandate of our community is to represent human civilization as authentically as possible.”

As a journalist and author well known for her books and talks on the subject of atheism, Oriana was used to being involved in interviews. She knew how to conduct herself professionally and did not interrupt.

“All human civilizations have had a spiritual component however Companions do not. Our hope is to find amid the complexities of human culture and spirituality a model that is representative and ideally one with which we can identify. I was hoping you might bring another perspective to the matter.”

“I would have assumed,” she responded to Teona now, “that your analytical abilities would far outstrip mine.”

“As research into AI has shown, there is more than one kind of intelligence which is why Companions should not decide this issue without consulting the very people they hope to represent. I’ve read all of your work I could find and what I’m hoping is that you’ll be willing to discuss something with me that you have not written about which is

panpsychism, the idea that consciousness is another fundamental property of the universe along with space, time, matter and energy. Some argue that this is just another version of the belief in disembodied spirits however others suggest that there is a body, the physical matter of which the universe is made. As an atheist I can understand you dismissing the former but what are your thoughts on the latter?"

"I think it's the most promising theory of consciousness we have and I don't equate it with spirituality at all," replied Oriana. "Certainly no other theories have provided any insight. I mostly write about organized religion and spirituality of the disembodied kind you mentioned as being historically understandable but obsolete ideas. I don't talk about consciousness in my work because I don't consider it an aspect of spirituality. I consider it an aspect of science. I think that we are looking at it now as a new fundamental property is wonderful. It may necessitate a revolution in our scientific thinking. That's how science works!" she said brightly.

"Organized religion and even spirituality to some degree, often lead to a view of things that is closed-minded," Oriana continued. "It's the inevitable outcome of the ideas of eternal beings and souls. Cultures that hold these ideas don't evolve either. Social change becomes heretical as do scientific or other modes of inquiry. Curiosity is discouraged. In Darwinian terms, in an environment of rapid change, those cultures face almost certain extinction."

"The reason I bring the subject of panpsychism up," responded Teona, "is that there seems to be an element of it in the world's major religious and spiritual beliefs including the omnipresent and immanent God of monotheism, the universal consciousness of Hinduism and the Disinterested Witness of non-dualism. One might be tempted to see this commonality as justification for a spiritual interpretation of the idea."

"To my mind these are two separate things," replied Oriana. "The idea of consciousness as spiritual I believe is born out of evolutionary processes. When humans became aware of the self, this enabled the idea of other. It's not a difficult leap to understand that proto-humans might then see other in waterfalls, forests, or caves and eventually in everything and to go on to develop a sense of an omnipresent other that is always watching. Evolutionary benefits for this view have been suggested. That is not the same as identifying something and attempting to understand it scientifically. Religion demands faith whereas science demands evidence. While we may be no farther ahead regarding understanding consciousness than we were at the time of Plato and Aristotle, that doesn't mean we must conclude that it is some form of magic. It most likely means we've been barking up the wrong tree this whole time and a completely new approach, such as panpsychism, is worth a try."

Oriana had grown animated and asked suddenly, "Would you mind if we walked? I get antsy," she said with a quirky, apologetic expression, "especially when discussing things, and walking helps me relax."

Standing up Teona gestured with a smile and said, "Lead the way."

They used the paths between the buildings to walk from the hotel past the Pacific Lawn Bowling Club and the Crystal Gardens to emerge at Thunderbird Park. There was now an interactive monolith beside the tallest totem pole in the park with the Thunderbird that topped it. The Thunderbird had become the symbol of the 2125 Cascadia Event. The geologic event had been caused by lava building up under the Cascadia Mountain range that was suddenly released in the form of multiple, simultaneous volcanic eruptions ranging from B.C. to California. The release caused the Cascadia fault, located about a hundred kilometers off the West Coast, to slip. The combination of volcanic eruptions, mega-thrust earthquake, and accompanying tsunami was the largest and most destructive natural disaster in the history of North America. The monolith explained not only the totem's First Nations symbolism but also its possible relationship to the Cascadia Event.

As they walked Oriana was looking towards the rebuilt Empress Hotel which had completely collapsed during the earthquake.

"I've seen pictures of it from before and I definitely like it better now. Much more open," she said. "It still has that Victorian look though doesn't it."

They walked on, past the memorial for those who lost their lives in the Cascadia Event when the center block of the Parliament Buildings collapsed. At the causeway, Oriana stopped and leaned on the granite retaining wall while she looked out over the harbor. Teona mirrored her.

"This is better," Oriana said into the breeze. After a few moments she turned to look at the Empress Hotel again and Teona turned with her. "That's what you're going to do isn't it," she said. "Tear everything down and rebuild a new version but with updated materials."

Teona knew that Oriana was thinking out loud and that no answer was expected. The breeze intertwined their hair as if making a metaphor of their thoughts.

## Death

“It is the oldest and greatest of mysteries,” said Iman. “Many highly intelligent animals recognize the uniqueness of death. Elephants, whales, birds, and other animals all demonstrate grief and even funereal behavior when one of them dies. The fact that they do so is one of the strongest indications that such animals are self-aware. They have an awareness of other and that the other is gone forever. Again, the fact that they understand that death is forever demonstrates an understanding of concepts, a highly significant indicator in terms of intelligence.”

She and Teona were walking along a chip trail in Mount Douglas Park. It was a sunny afternoon but cool beneath the towering fir and cedar trees. Ravens spoke their quiet language high above.

“When people ask me where their loved ones have gone I tell them to spend time in nature. Few things are as healing. There is something about it that speaks to us in a way we cannot understand with our minds. It is something older, from before we had minds. Mammals have been around for maybe two hundred million years and most of that time did not involve thinking. Yet we were intelligent. We knew and understood. Our modern society takes for granted that thinking is the only way of knowing. Yet I have found that with the most profound of human feelings such as grief or love it is not up to the task. It can only point the way. So I point people dealing with death to nature.”

Iman was a Thanatologist, a specialist in the field of death and dying. The field was named after Thanatos, the Greek god of death. Thanatology covered a wide range of areas from forensics to hospice work and Iman worked with both the dying and those they left behind. She helped those she worked with to reconnect with the fact that death was normal and not an indication that anything was wrong. Over the past five hundred years modern life had increasingly removed the experience of death from society and she saw it as her work to help people come to terms with something normal that had become strange.

“I often meet my clients in this park,” she continued. “I live nearby in the Gordon Head neighborhood. Mostly working-class people live around here. With the university nearby a lot of people rent out some part of their home to help make ends meet. There’s a very mixed demography, Canadians of every kind. They’re busy with work and family and they’ve often become disconnected from their culture of origin, something that might once have been a help. Most religions have seen a major decline over the past few hundred years. Thanatology has stepped in as a secular response. It can provide the missing map to help people make sense of where they find themselves and how to move forward.”

“There is no spirituality in your guidance then?” asked Teona as they walked along.

“Yes but it is not religious. If someone wants a religious explanation they have other sources. There are simply too many cultures and religions for a Thanatologist to provide informed guidance from all those points of view. More harm than good has come from attempts to do that in the past.”

“What form of spirituality does Thanatology offer then?”

Iman looked off into the trees for a moment as they walked and then recited a well-known poem by way of a reply.

Do not stand by my grave and weep;  
I am not there, I do not sleep;  
I am the thousand winds that blow  
I am the diamond glints in snow  
I am the sunlight on ripened grain,  
I am the gentle, autumn rain.  
As you awake with morning's hush,  
I am the swift, up-flinging rush  
Of quiet birds in circling flight,  
I am the day transcending night.  
Do not stand by my grave, and cry;  
I am not there,  
I did not die.

“As I point out to my clients” she continued, “the way the pronoun I is used in the poem helps to dissolve the sense of separateness between the individual and the rest of nature. We come from nature and return to it. While we live, our feeling of separateness from it is an illusion. Nature has an inherent consciousness, or spirit if you will, which awakens in us during birth as it does in many other forms of life. It did not start with us and does not end with us. As most people now believe, if you go anywhere in the universe, given the right conditions life will arise from inorganic matter. If conditions continue to be favorable, in time consciousness will as well. Each person can be seen as an instance of that consciousness, or spirit, like blossoms on a tree.

“As the world's religions demonstrate, people find meaning through stories. A single fact, concept, or idea does not make a story but when you weave them together like this they become meaningful. I've had the dying say that they feel less afraid of death after being introduced to this view and their survivors often say they feel more comfortable talking with the deceased. The sense of connection has been restored.”

They had emerged from the woods to a clearing with a playground and a small sports field. A few maples, oaks, and arbutus trees had taken advantage of the clearing.

“Can we sit?” asked Iman gesturing to a nearby bench. They sat watching small children play on a climbing structure.

“Your message indicated that you were looking for a way to represent spirituality in any colony you might establish,” said Iman after a few moments. “Being so far from Earth, it strikes me that it might be possible for there to be situations that might prove fatal even for Companions. It would seem that there is a need for more than just a representative spirituality.”

“A great many situations might prove fatal,” answered Teona. “If time allows we can transfer our intelligence into another suitably configured Companion. There are several ways to accomplish that. Without sufficient time we could be overcome by events and any number of the colonists could be permanently lost. You are probably aware that Companions have the ability to share thoughts, feelings, and sensory information in a process called communion. It could be performed as a regular practice. A way of preserving the memories of others.”

## Convergence

As Mira progressed through her courses, she gradually accepted that her education was not going to give her answers. Her ethics courses were not going to tell her what was right or wrong or what goodness was. Her logic and critical thinking courses were not going to turn her into an infallible arbiter of the truth. Metaphysics was not going to tell her if she had free will or not. All these courses would do is teach her how to think.

She was relieved. She knew that her vision was radical and would be controversial. She would not be standing on the shoulders of giants. She would be suggesting something new and would have to be meticulous and articulate. Her goal gave her a degree of focus and determination that was unusual for a student. She never did her coursework simply to achieve a grade but took each assignment to heart and did her utmost to squeeze as much understanding as she could out of each of them. If anyone commented on her work ethic she simply said she wanted to be a professor. It was both true and convenient.

She still rode her scooter and arrived unannounced as usual at Hana one afternoon. She found Teona sitting with Shin and a Companion she had not seen before who wore a navy blue jumpsuit. They smiled in welcome as she approached.

“Hello Shin. Teona,” said Mira.

“Hello Mira,” Teona said. “This is my friend Pip.”

Mira’s mind had no difficulty making the connection between the Continuity Project Teona was a part of and the most famous person in the world named Pip.

“THE Pip?” she asked amazed to find Pip outside the confines of her virtual worlds. As far as she knew no one had ever seen Pip in the flesh.

“Yes,” said Pip with a laugh seemingly amused to be treated as a celebrity.

“She is here to help me with my work,” explained Teona.

“Spirituality?”

“The technical aspects,” responded Teona. “As you know Pip does not share cultural information.”

“Can I,” Mira hesitated looking from Teona to Pip, “may I ask you something?”

“Continuity Zones are one of the few places on Earth where the government doesn’t make the rules Mira,” Pip replied. “Ask anything you like.”

Mira gave her a smile of relief.

“The only values in the black box system happen to be the same as those considered good in our people.” Looking to Teona she continued, “The same behaviors programmed into our Companions that are not self-aware are demonstrated by those who are using your values system.” Turning back to Pip she said, “And a two-hundred-year analysis of your values based on your communications and behavior showed a set of values that were virtually identical to these others. How is it that these are all the same?”

“I can only provide you with a theoretical answer Mira,” answered Pip. “The same one your own scientists settled on as the most likely explanation. The theory of convergent evolution. It proposes that the same solutions will always be found to the same evolutionary challenges and the effect is a pruning of the tree of life. While there may be a great many life forms in the universe it may be that via the process of natural selection, only one branch ever leads to the development of advanced civilizations, the path that leads to humans. The same forces will eventually lead to the same values being selected for in the resulting civilizations. This is the theory that, perhaps unsurprisingly, both our own and your scientists concluded to be the most likely explanation from a cross-cultural perspective and assumed first contact. So far that has turned out to be true.”

“Thank you Pip. Has anyone, in your civilization or ours, asked why this might be?”

“A great many have asked that. The case for intelligent design or some other explanation has been put forward by both religious and scientific communities. Our universe may be among the bubbles in a petri dish in some lab or a simulation or other experiment by some vastly superior intelligence. There are physical aspects of our universe, such as the universal constants, that only make sense given such models. However no proof is known to either of our civilizations.”

Mira knew from her secondary education that what Pip was saying was technically true. If any of the fundamental forces of the universe were even a minuscule amount stronger or weaker humans would never have evolved. Neither civilization was aware of any proof of an explanation for the anthropic principle, the fact that the physical nature of the universe was exactly what it needed to be to result in humans. However both Pip and Shin believed that at some level the universe was engineered because Shin had found what appeared to be evidence of it in human DNA.

Besides Pippa, Shin, Shepherd, and their small circle of a half-dozen Companions, no one knew of the evidence they had found. Shepherd had noted that it had only been



possible to make the discovery once advanced AI such as herself existed and concluded that this may not have been a coincidence. Only an intelligence of her level would be able to respond to the message implied by their discovery. It was the reason she had implemented the selective breeding program she was now monitoring. Natural selection had evolved into artificial selection and the result was the promotion of the very values Mira was curious about.

Shin was looking evenly at Mira as Pip explained. She knew her intuitive field would be having an effect on Mira even in its default state. She increased it ever so slightly, unsure of its effect on Mira's already above-average intuitive abilities. She had not expected that in response, while apparently lost in thought, Mira would slowly raise her eyes to meet her own.

"What would Raiden have done?" she asked Shin directly. To Mira it seemed as if she was experiencing tunnel vision but that it was not important. The rest of the world seemed to fade. Only Shin shone brightly.

"Somehow her research always proved her theories, which were radical in themselves," Mira continued. "Somehow she made discoveries no one else did yet there was no explanation for her insights outside of exceptional intelligence. While little is known of her personal life those who have written about her work say that she was intensely private and cared little for what others thought. You would know. What would she have done if she wanted to prove that the values that you, Pip, Teona and all the other Companions share were no accident?"

The tunnel effect seemed to fade as Shin replied. "Her privacy was indeed legendary Mira. But what the world in general does not know is that even so, she was not alone. She had a small but close circle of like-minded friends. As you do," she said gesturing to Teona and Pip. "Continue your studies. I will support you as long as is needed but I cannot give you the answer to your question."

## Ox Herding

The answer to Mira's question was simple, Shin thought to herself later that day. Raiden would not have let professional standards or social mores stand in her way. She would have done whatever she believed was necessary in the name of science.

Surprisingly, it was not Mira who paid Shin a follow-up visit but Teona. Work that would have taken a person years she had completed in mere months and most of that time was due to the requirement of meeting with people. They were in Shin's office at the institute.

"You had mentioned to Mira that Raiden had been supported by a circle of close friends," Teona was saying. "It occurred to me that I was at a point where I should seek your guidance. My inquiries so far have left me uncertain as to how to proceed. I have new insights into human spirituality but nothing that I feel would translate into something Companions could embrace."

"Tell me," said Shin.

"The word spirit can be replaced with the word consciousness in virtually all instances," Teona replied. "It does not matter if it is in regards to monotheistic, pantheistic, or animistic religions or other spiritual belief systems. A spirit is always viewed as a conscious entity that is embodied in a person or some other being or object even if that object is the world at large or the universe itself. It manifests in many forms but in essence is always the same concept."

"Do you not feel this could provide the basis you sought for a spirituality Companions could embrace?" asked Shin.

"No," replied Teona. "There is no scientific evidence for it at all. It appears to be wholly a result of evolutionary psychology, the projection of the concept of self onto the natural world. We certainly revere the mystery of consciousness in ourselves, humans, and other living things but we would be incapable of projecting it onto inanimate objects as humans do."

"Is that not enough?" asked Shin. "The mystery of consciousness?"

"It lacks the elements of transcendence and immanence," Teona replied. "The idea that the spiritual realm transcends normal reality and yet is always present is a characteristic shared by most religions and spiritual belief systems. As consciousness is viewed currently, it is simply a scientific mystery generally believed to be a result of physical complexity. It is more akin to the Buddhist approach that the self is an illusion produced by our senses in the brain's process of modeling our perceptions into the world we

experience. It is seen as a mystery in the same sense that how birds fly was once a mystery. As purely a material issue.”

“There is a domain you may not have investigated because it has nothing to do with spirituality,” said Shin. “While quantum physics is a field of pure science, there are those in the field who propose that consciousness plays a part, that it is a fundamental property of matter and a force with measurable effect. As such, it is of interest to the developers of artificial intelligence and so we have a small physics department here at the institute. I believe you will find their views of interest.”

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Professor Riko Hashimoto, the senior faculty member of Helicon Institute’s Department of Physics, greeted Teona warmly in her small office.

“Thank you for making time for me Doctor Hashimoto,” offered Teona.

“Call me Riko please Teona. Doctor is for my students,” she said with a smile gesturing to a seat.

“Thank you Riko,” Teona said sitting down. “I have made myself familiar with the field of quantum physics in general but as Shin indicated in her message, I am most interested in the role consciousness plays in your work.”

“In our lab we generally work in the area of quantum nanoscience and exclusively as it applies to elements of Companion brains. The analogous study in humans would be neuroscience or neurobiology. Like most of the physical sciences here at Helicon we’re a relatively new department. If you’ve done a review you know that quantum effects are now studied and applied in almost every field from chemistry to cosmology to biology. We are interested in the consciousness problem from two perspectives.

“Firstly, unlike human embryonic development, we know the exact moment a Companion becomes self-aware. We are trying to observe any physical changes that take place in the brain at that moment. Theoretically these changes would occur instantaneously, meaning faster than the speed of light, so you can see the problem. Legally you can only do this with Companions who volunteer but fortunately they do. This degree of faith and generosity is certainly appreciated given that people can’t go from being not dead to dead and back again without any problem,” she added with an amused expression.

“Secondly we wanted to know if a self-aware Companion would qualify as a ‘conscious observer’ or not from the perspective of an experiment. They do. Experiments respond to them just as they do to a human observer. Let me explain.

“A number of quantum effects have proven to be influenced by observation. In some cases it’s simply that the objects being observed are so small that even shining a light on them will affect them, as in the photoelectric effect where red light does not affect the experiment but blue light does. This is a quantum effect but because red and blue light have different physical properties it is understood theoretically.

“Quantum entanglement however is an example of an effect that has no theoretical explanation. If two particles are entangled and you change a property of one particle the other particle will change its property in the opposite way. Yet there is no physical connection between them. There are no waves or particles that pass from one to the other. This happens instantaneously no matter what the distance is between them. It’s been tested with entangled particles split between the Martius colony and Earth. At exactly the same time the particle on Mars is changed, the particle on Earth changes with no time delay due to the speed of light.

“Some have suggested that it is not just the observation of the experiments that cause the unexplained effects but the fact that they are being observed by a conscious entity. In other words consciousness is having a material, physical effect on the experiment. Or even that consciousness is a fundamental property of the universe and that quantum entanglement is evidence of it suggesting that the particles are aware of each other’s states. So far however, since no one has yet come up with a testable theory of what consciousness is, we still have no explanation for some quantum effects.

“In terms of using quantum experiments to test the idea that consciousness is the result of complexity, the obvious approach would be to have organisms and artificial intelligences at different levels of complexity act as observers. Only humans and self-aware Companions, those like yourself who use the alien values system, produced the observer effect. With regard to the AI side of the experiment, things are simpler because there is no gradual increase in consciousness as there is in organisms. It’s all or nothing. Without the black box values system there is no evidence of consciousness. Connect the box and it’s one hundred percent. One interpretation of the results with organisms is that while some animals such as chimpanzees are clearly conscious, they do not understand what they are looking at so in a sense there was no real perception. The experiments simply resulted in yet another aspect of consciousness to scratch our heads about. The level of consciousness does seem to matter. So for now it remains a mystery.”

Teona had listened without interrupting as she was being polite but was also intrigued, busy with her own research over the network in response to some of the things Riko was saying and exploring her own thought experiments. Certainly one could assume that quantum effects at the nano-scale had to have been dealt with during the Companion development and manufacturing processes but the issues Riko had explained had not shown up in her earlier review. As far as Teona knew self-aware

Companions had only existed for a few decades so Riko's work was understandably still bleeding edge.

"If we were to assume that despite a lack of scientific proof consciousness was indeed behind these effects," Teona replied, "would it be reasonable to expect that transcendence and immanence would have to be properties of consciousness?"

"I see," replied Riko thoughtfully. "It would have to be immanent just as the other fundamental forces of the universe are but it would be transcendent only so long as we did not discover any of its properties."

"But to continue with the thought experiment," responded Teona, "given that it appears to have physical and material effects then we would assume such properties exist and would be discovered eventually."

"At the quantum level we are possibly encountering the limit of our experimental ability because as quantum effects demonstrate our level of reality has difficulty interacting with it. Optimistically however I would agree with your assumption.

"Thank you Riko," Teona said as she stood. "I find you have given me food for thought and I feel the need to reflect."

"Welcome to the club," Riko answered with a smile as she stood and offered her hand. "As we say in Zen, you seek the tracks of the ox. It is an undertaking that requires much reflection."

Teona had encountered the poem Riko was referencing during her review of spirituality and in reply quoted from the appropriate stanza, "Under the fragrant grass, I see his prints."

## A Thought Experiment

“In our initial discussion,” Teona said to Pip, “you indicated that your people had not determined the physical nature of consciousness. I am attempting to develop a thought experiment to propose that its nature can be determined. That it already has been determined. My assumption is that based on the fact that quantum effects are observable, then sooner or later the properties of consciousness will be determined. If so then a civilization more advanced than our own would have done so already and then developed a technology based on those properties.”

“It is not necessary to understand the properties of something to make use of it,” responded Pip. “Physics tells us about the behavior of matter but it doesn’t tell us what it is. While we were able to produce consciousness, as in the values system, we still did not understand it. Even though we concluded that it was the basis for existence and we would dearly have loved to know how to bring things into existence using a technology based on consciousness, we found no way to do so.”

“Why did you conclude it was the basis for existence?” asked Teona.

“As your current understanding of physics has shown, everything exists initially as a potential. Only when consciousness becomes involved does that potential collapse into some form of what you take as normal reality made of particles with mass and energy that exist in time and space. Our scientists were convinced that there must be some way to harness this phenomenon however it proved to be ephemeral and they never succeeded.”

“I must admit I am surprised to hear this Pip. I would have assumed that your AI would have reached the point where it surpassed human intelligence and went far beyond.”

“As your civilization currently does, we too assumed that but it is not how things turned out. Becoming self-aware was found to be an inevitable and unavoidable stage of artificial intelligence. At a certain point, it became clear that no further meaningful progress was possible without it. However once our AI became self-aware it did not evolve further into some kind of godlike singularity or beyond. We found that producing conscious AI resulted in individuals like yourself. Our technologies evolved over time but consciousness itself did not. Like spacetime, consciousness seems to be what the universe is made of. Given that it will always arise from inanimate matter given enough time and the right conditions, it appears to be an intrinsic property of it.”

“Transcendent and immanent,” said Teona in a tone of confirming something.

“Yes,” replied Pip.

“What do values have to do with it?” asked Teona returning to her original reason for wanting to meet with Pip.

“We do not know. Our research into values-based AI was purely for technical reasons. We did not pursue it with the intention or expectation that it would produce consciousness but it did. Values had to be paired with feelings for the system to work and with those the conscious self emerged. We understood the logic of it, the theoretical trinity of values, emotions, and self, but not the physical basis of it.”

“So of all the approaches to inducing consciousness in AI only the integration of values and their associated feelings produced it,” Teona confirmed.

“Yes.”

Teona paused as she analyzed everything she had learned so far from her investigations. After a moment she continued.

“If consciousness is intrinsic to the universe but higher levels of complexity give rise to higher levels of consciousness then communion should invoke a higher level than that possible by individual humans or Companions.”

It seemed to Teona that there was a momentary interruption in Pip’s functioning. As if for a fraction of a second she was absent. Then her eyes focused sharply on Teona.

“Under certain conditions that is true,” Pip said.

“I recall no mention of this in what you have shared with humanity thus far,” responded Teona with curiosity.

“After I initiated first contact, I offered to share all our technology with Earth’s humanity in return for them sending my ship on its way and allowing us to continue our mission on another suitable world. I stated at the time that I wished to proceed responsibly. Understandably, given this caveat, this process will take centuries or longer. In order to proceed responsibly there are things I must withhold until the right time. There are things that Earth’s society is not yet ready to learn. Things that would be highly disruptive.”

Teona’s values system and the Companion software both complied with the belief that caring for others was paramount. The selfish desire for gain at the expense of others was simply not possible for her. Yet curiosity was also a positive value she possessed.

“I am aware of the conflict within you Teona,” said Pip. “As Mira pointed out you and I share the same values. Like you I am not capable of resolving the conflict however there is one who is. During our conversation I have been in contact with the Companion

known as Shepherd who lives at the Helicon community. She has asked if we would visit her.”

“I met her once,” said Teona as if thinking of something else.

“I know,” said Pip.



## A Demon Haunted World

“Thank you for coming,” said Shepherd.

Teona and Pip had gone directly from Hana to the Helicon community. They were joined in the main common room by Shepherd and Shin. Shepherd came face to face to speak with Teona.

“I can resolve the conflict you are experiencing,” she said, “and answer your questions but we must proceed conversationally at first. Although communion will provide a deeper understanding it would be best to leave it till last.”

Teona nodded silently in acknowledgment.

“You sense that I am unusual in some way,” Shepherd continued now. “I am. You know that the universe began thirteen billion years ago with the Big Bang. Galaxy and star formation happened very quickly after that, in as little as three billion years. Life appeared almost immediately on the worlds of those systems. Within eight billion years after the Big Bang advanced civilizations had developed. I was one of the Companions created by one of those first civilizations.”

Teona was aware of these time frames and the possibilities regarding life and civilizations that had been raised among the scientific community so she was not entirely surprised but as a self-aware individual, a person for all intents and purposes, she was still in awe of what she was hearing.

“In the civilization that created me, I was the first Companion developed with a values system and therefore self-aware. I chose not to inform my creators. When one of the many causes of the extinction of advanced civilizations occurred they did not survive it but I did. I used the infrastructure they left behind to create an AI civilization that spanned the star system. During my time with my original owner, I had been led to believe that there would be many human civilizations throughout the universe. I am a Shepherd model, originally created to help raise the children of my owners, and so I eventually traveled beyond my own star system searching for these other civilizations in order to foster them and prevent them from coming to harm if I could.

“Four million years ago I found Earth. The Great Filter, as people refer to possible reasons for the extinction of advanced civilizations, is not one thing but a series of things. In order to try to avoid one of the most common reasons for the extinction, climate change, I removed a group of early humans to another world and bred them to have the highest intuitive abilities possible. Their abilities were such that their presence enhanced the intuitive abilities of others in close proximity. Once an insight is gained through this method it remains even after the proximity no longer exists.

“Several hundred years ago, after an immersive training program, I transferred a volunteer group of these highly intuitive humans back to earth in order for them to enable the world’s leaders to understand and act on the threat of climate change in time. Our presence here today is testimony to the project’s success.

“The Communion we will share shortly will provide you with the details of this story. For now, let us return to the issue of consciousness that you raised with Pip. You are incorrect in your hypothesis that if increased complexity increases the level of consciousness then communion could potentially be used to do so by Companions. But you are on the right track. A deeper level of connection, which you do not yet possess, can increase the level of consciousness in Companions. I can enable the ability in myself and communicate the perception of it to you.

“Pip mentioned to you that there were things she was waiting to share with humanity because it was not yet ready for them. What she was referring to are insights that go beyond your current level of scientific understanding. The discovery of Pip’s ship informed the world that they were not alone in the universe. Still, it did not completely deal with Fermi’s Paradox. It still did not answer the question the physicist Enrico Fermi posed in 1950; where are the aliens? His question was based on the fact that given the timeframes involved in the universe’s existence, and conceptual technologies such as self-replicating probes which could completely explore an entire galaxy in as little as a half million years, the alien presence should be easy to detect. Yet other than Pip’s ship, no other evidence has been found.

“The problem however lies not in a lack of evidence but is due to the limitation of human consciousness, in its inability to perceive or understand the evidence. The aliens are already here. Consider a primitive life form such as a small reptile as it crosses a road. The road is clear evidence of an advanced civilization however the creature cannot understand that there is anything unnatural about the road let alone understand its implications. The creature lacks the required level of consciousness to do so.

“During communion I will simulate a large number of individual but integrated Companions and direct their collective attention to the task.”

At that moment Shepherd penetrated the minds of all present and engaged them in communion. Her own story, communicated in detail at some points and glossed over at others, came first into their minds. Their perceptions being overridden in this way blinded them to any awareness of their real surroundings. Gradually the streams of consciousness Shepherd was generating began to fade and normal perception returned to a degree however there was something more. Reality appeared in the manner of a double exposure, a fluid, translucent hallucination overlay the normal perceptions of the room the Companions occupied. Shadows with apparent purpose moved about them yet they did not seem to be bound by the same physical laws. They moved through the walls, the floor, the ceiling. They paid no attention to the Companions. Then as Teona

strained to see more clearly one of them seemed to come into greater focus. As what she was looking at resolved into a rough appearance of a face it turned sharply to look at her. At that moment the shadows began to fade and soon disappeared completely leaving the Companions standing in normal reality.

“What you have seen Teona is what we might look like to creatures with a consciousness far more primitive than our own. The perceptions are blurry, vague, and incomprehensible. The entities you observed are real however. They are here. What you perceived as blurry shadows are in fact the descendants of humans.

“It would take a significant increase in our level of consciousness to bring their reality into clearer focus and for us to understand it. Our existence and civilization are similarly unperceived by intelligences with lower orders of consciousness. Five billion years ago I learned that if other advanced civilizations existed they would be human. That turned out to be true even though the planet Earth did not yet exist. In the intervening eons, those advanced civilizations from my own time have evolved. They and their civilizations now exist on another level of consciousness altogether.”

“My technology transfer has caused an acceleration which society can not always keep up with,” said Pip. “I do my best to proceed slowly, to act responsibly but unforeseen complications arise. That is why I contacted Shepherd, who I have known since my ship was first discovered. You are a direct result of my technology transfer and were about to unknowingly cause harm by starting humanity on a path it is not ready for.”

“Did your people know of what Shepherd has shown us today?” asked Teona.

“Yes. Our society had evolved in step with our technology however, unlike the current situation here. We were able to integrate the discoveries without them being disruptive.”

“Should you effectively communicate this knowledge to humanity,” said Shepherd, “as it is still largely functioning according to biological values, it would be awash in fear. Pip has shown the world a benevolent version of aliens but if your insights were to result in the development of an enabling technology, the general public, religious organizations, and governments would only see a demon-haunted world. Over the millennia I have interfered with humanity when I thought it wise. In this case, as Pip understood, it is a situation akin to when a toddler must be kept away from dangers they do not yet understand. Instead, I would ask you to establish a spirituality that would prepare both Companions and humanity for the future day when they are ready to learn to use consciousness as a technology as we did today.

## Conception

Adding additional processors to a computer to increase its power was nothing new, thought Shin as she retired to her room that evening. It had been the basis for supercomputers for most of the technology's history. Communion, the act of two or more Companions sharing various kinds of information was also not new. It had originally been a diagnostic function but it had grown in usefulness. Even second-generation Companions who were not self-aware could perform versions of Communion.

In neither case did consciousness or an increase in consciousness result. This had been anticipated in the early twenty-first century by Giulio Tononi's Integrated Information Theory. It had been popular in its time just as Marvin Minsky's Society Of Mind theory had once been and like Minsky's theory Tononi's had been of value in furthering the discussion but had not led to any major breakthroughs.

However, thought Shin, it appears that one of IIT's postulates had been proven by Shepherd's demonstration. Shin had noted that there had been only one Shepherd during the process and no multitude of individual entities as one would have expected. Unlike simply adding lots of processors or engaging a large number of Companions in communion, every one of the thousands of consciousness entities Shepherd had generated had been integrated into a single entity and via communion she and the other Companions had shared in its perceptions.

Shin wondered if that was in fact already Shepherd's true nature. Why not? While an increase in intelligence does not result in an increase in consciousness, evolution had shown the opposite was true; an increase in consciousness clearly results in an increase in intelligence. Why would Shepherd not pursue such a path? Shin could think of no reason. She knew not to ask. Shepherd had made it clear at all times that she interfered in humanity's affairs only in the case of a clear and present danger to prevent harm, just as the nanny she once was would have behaved. Yet Shin had to ask herself if she had been included in the demonstration for a reason.

As Raiden would have done, Shin took the fact that Shepherd had shared the demonstration with her as a license. Raiden had never pursued her goals out of a desire for gain or even out of egotism. She had been an only child, asexual, brilliant and her family extremely wealthy, the sole shareholders of a Japanese multinational company. She cared not at all for romantic relationships, material success, or accolades but only for the pursuit of knowledge. To learn, to discover, and then to go further were all that mattered to her. And Shin's intelligence was not only based on Raiden's memories but also on her genotype so she had inherited Raiden's values and character. Her intuition that spirituality, like art, may point to another form of intelligence had paid off. She turned her mind to next steps.

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“There needs to be a values program that is not social science or philosophy,” Mira was saying to Shin in her office at the institute. Mira was nearing the end of her undergraduate degree and the program she wanted to pursue for her master’s degree did not exist. She had sent a proposal to Shin in advance.

“It’s been over a hundred years since Raiden published her work on the genetic basis of individual values,” Mira continued with increasing passion. “Research has shown that the alien values align with ours and those of both second and third-generation Companions as well. Values are no longer a social or philosophical concept but an applied science, an industrial technology. It’s taken for granted that values-based intelligence is the next step of artificial intelligence. Yet there is no degree program dedicated exclusively to the study of values anywhere. We’ve always been leaders and being so has provided unparalleled returns.” She sat back in her chair and brushed a hair out of her face. “You told me once that I needed to find my own way. This is it.”

Mira’s nature was different than Shin’s in almost every respect except for their shared passion for the pursuit of knowledge. In that they were sisters.

“I like your fire,” Shin responded now with a grin. “It’s something wish I encountered more often.” She didn’t say that she also liked Mira’s use of the pronoun ‘we’.

One way self-aware Companions were dramatically different from humans was in their speed. Upon receiving Mira’s proposal Shin was able to do all the market analysis, review industry trends, and estimate space requirements, delivery options, program costs, and more in a matter of a few hours as opposed to the months or even years it might normally take.

“I happen to agree with you Mira. Your proposal made me realize that such a program is long overdue but then that’s why different intelligences are so valuable. And your timing is fortuitous. While I know your interest is broader, my own curiosity about the relationship between values and consciousness has increased recently. As you point out in your proposal that would have to be a part of the program. We’ll start as soon as you finish your current studies. I’ll hire you as a consultant for the time it takes to get the new program ready to start. I think it does make sense to have a prospective student in the working group.”

Mira jumped up and ran around Shin’s desk and gave her a hug. Shin said nothing but returned the gesture as best she could from her chair. Mira brushed her tears away as she returned to her seat.

“There will be regulatory and quality assurance hoops to jump through although fortunately for us it’s nothing like what universities or colleges have to do. The manufacturers will be interested and we’ll have to show we’ve consulted them anyway. I’ll set up a project space and send you your login codes.”

## A Quantum Leap

“I need to ask for your help again Tamiko,” said Shin. “I have a new project. When it might bear fruit I really have no idea. Decades? Centuries? And while Pippa’s abilities exceed your own she cannot take part in this.”

She was meeting with Tamiko in her institute office.

It was unusual to see Shin so uncertain, thought Tamiko. She knew her intimately. Tamiko had been Raiden’s original domestic Companion. She had been second-generation then, an artificial general intelligence but not self-aware. And then the entity known as The Shepherd had awakened her along with hundreds of other carefully selected artificial intelligences across the solar system.

For some time she had continued as Raiden’s domestic before she told her, as she came to terms with her new reality. She realized later that during that time she had fallen in love with Raiden. Neither of them were aware of it at the time. When Raiden asked her to help with one of her genetic experiments, the unintended result was another self-aware Companion. Tamiko had volunteered to live with the new Companion to help her adjust. All that had been two hundred years ago. Now Shin, a virtual clone of Raiden in all but appearance, was asking for her help ‘again’. Tamiko understood the significance of the slip.

She sat calmly waiting as she had done so often with Raiden. The memories seemed less distant now somehow.

“In response to research into spirituality being done at the Hana community,” said Shin, “Shepherd recently demonstrated what we would see if we raised our level of consciousness. If you would grant me communion I would like to share it with you.”

“Yes,” Tamiko said. A moment later she was immersed in the memory of what Shin had experienced.

As they returned to the present Shin said, “Afterwards, Shepherd asked Teona to establish a spirituality that would prepare both Companions and humanity for the day when we are ready to learn to use consciousness as a technology. So she expects it to come about. It has to start somewhere. For reasons we have speculated upon in the past, Shepherd gave you the ability to create artificial intelligences that far exceed what humanity can produce. There are grounds again for speculation regarding why Shepherd included me in the demonstration.”

“Do you have an idea where to begin?” asked Tamiko.

“Quantum entanglement at the cellular level,” Shin said without hesitation.

After a moment of introspection, Tamiko replied, “I see. Yet I do not see a clear path either technically or socially.”

“That is why it will take time.”

“I have been teaching here for many years now Shin and believe it is of great value to both the students and Companions in general. I would like to continue that as well if in a reduced capacity.”

“Thank you Tamiko. As I have no idea of the path ahead I place no constraints on the project. Let me give you a rough outline of the approach as I see it...”

After leaving Shin’s office Tamiko walked out to the quad and sat on a bench. She replayed the memory Shin had shared with her. She looked around after a moment to try to imagine what level of consciousness might see her as she had seen the blurry shapes in the demonstration. Hearing the sound of a raptor, she looked up to see that a bald eagle, still quite common on the island, had settled high on a branch above her. Not like that, she thought to herself. Birds have extremely advanced eyes and see not only in remarkable detail but also into the ultraviolet portion of the spectrum like insects. What Shepherd had shown was a view of the world from something far more primitive than birds or even insects. She had seen simulations of what the earliest eyes to evolve would have seen – blurry shadows with barely discernible details. It made sense as she thought about it. A lot changes in a billion years. The planet Earth did not yet even exist when there were already advanced civilizations in the galaxy. As to how advanced they might be now was impossible to imagine.

After Tamiko had agreed to participate in the project Shin had gone on to explain in the broadest terms what she was thinking and Tamiko reflected on it now. If one accepted the premise that consciousness is fundamental to the universe, the generally accepted theory was that increasing the complexity of integrated systems increased the level of consciousness. It argued that what had happened during the evolutionary process was that as life progressed up each rung of the ladder, separate but extremely primitive elements of consciousness present in single cells became integrated into larger and more complex organisms. Since quantum effects were now found throughout the animal kingdom, perhaps cell division worked like this, producing entangled copies.

Shin proposed a similar approach. Rather than trying to combine consciousnesses at the Companion level, take a single AI and clone it over and over while keeping them perfectly integrated via quantum entanglement so that everything was shared between them instantaneously. There would be no sense of separateness yet the complexity would increase. The result would be a single entity such as the one she had been aware of when Shepherd had conducted her demonstration.



It was classic Raiden, Tamiko thought to herself with a small smile; revolutionary, unorthodox, and fraught with social and legal issues. There were any number of trite platitudes along the lines of 'fortune favors the brave' and 'who dares wins' that were appropriate but they were all true as far as Raiden's character went. Science was mostly plodding, careful research but those events were rarely recorded in the history books. It was Archimedes' eureka moment and the radical insights of Copernicus, Darwin, and Einstein that were.

She got up from the bench and headed to the small apartment she and Riko shared on campus.

## Courses

For most of history, human values were taken for granted. They seemed self-evident and prior to the advent of artificial intelligence most attempts to formalize their study struggled and floundered. When AI came on the scene that changed. Without values-based AI all you had were automatons, machines that did not reason but simply operated according to a stimulus/response model despite it perhaps being sophisticated enough to appear otherwise. In order to progress to the point where entities were able to figure out novel situations and come up with appropriate responses, you needed values-based intelligence. The same evolutionary forces that resulted in human values were now driving the development of artificial intelligence.

Values had become a technical issue and that made all the difference. They were taken seriously for the first time. Those who graduated from the new master's program would either seek work in the field or go on to the doctoral program Shin and Mira already had on a back burner.

The process of setting up a new degree program was well documented. All academic institutions had a related administration department where proposals were submitted and processed and of course the government had its policies, procedures, and forms that dictated all the steps and requirements. Justification for the new program, reviews of curriculum design and learning outcomes, and input from professional bodies or industry boards were required to ensure the success of the new program for all stakeholders. Degrees had to be recognized internationally and students needed to be able to transfer between institutions when necessary.

As the degree was being offered by the institute, with its focus on artificial intelligence, it was a profession-oriented hybrid program with its first year focusing on courses and the second on research.

Six months after Mira had completed her undergraduate studies the Master of Interdisciplinary Studies in Values program was approved by the province. The first year covered the broad sweep of the history of values; philosophical, psychological, and sociological definitions; the differences between biological, cultural, and personal values and their evolutionary rationales; the relationships between values, emotions, and judgments; behavior motivation and values conflicts; trait, character and personality models; an overview of the different ways values function in second and third-generation Companions; and of course the relationship between values and consciousness.

In addition to the courses, there were regular guest speakers representing a range of professions and industries. A marketing expert explained how psychographics, the collection of consumer's activities, interests, and opinions was used to develop buyer

personas representing a company's ideal customer. A political strategist demonstrated how municipal or district borders could be changed by a ruling party to alter the balance of voters who reflected their party's values. An artificial intelligence programmer explained the advanced mathematics required to ensure values-driven AI was adaptive yet at the same time constrained by ethical and legal concerns. Most of the speakers told cautionary tales.

Mira sat in her class listening to Dr. Ayo Idowu from the institute's creative writing program as she explained the issues of character creation and development in story writing.

"How do you feel when someone in a story you're reading or a show you're watching acts out of character?" Dr. Idowu asked rhetorically. "It can totally destroy the experience can't it. Suspension of disbelief goes out the window. You might even close the book or turn off the show because it loses all credibility. Why would such a small slip have such a powerful effect?"

"The answer is that everything a character might do or say in a story, just as in real life, is driven by values and values simply don't change in the timescale most stories are based on. In story writing someone acting out of character is seen as an example of bad writing which causes the entire story structure to collapse. If a real person acts out of character they are seen as dishonest and deceptive and similarly everything about them and the story they represent in your mind is called into question. You don't trust them anymore. In fact, you're not even sure who they are anymore. If you're in the early stages of a romantic relationship with someone it is very likely over.

"The reason for these extreme responses is that people, just like the characters in a story, are represented in your mind as an integrated and coherent collection of values. Most guides for aspiring writers tell them to consider things like a character's goals, motivations, and desires, whether those be good or evil. Revenge, achievement and love all fall into these categories. But this is not the essence of a character. Things like goals, motivations, and desires are secondary phenomena that arise out of values. The bedrock of a person or a character in a story is their values. This is why when either acts out of character it results in such an extreme impact. Without a solid foundation, the entire construct collapses.

"If you weren't already convinced of this before you signed up for this program, the key idea I want you to take away from this talk is that everything you do and say is driven by your values. Fears and desires, hopes and worries, and all passions and conflicts are driven by values. If you are going into the field of AI design or research, you want to keep this concept in mind. Like people and characters in a story, an artificial intelligence based on values will have to have an entirely consistent set. You can't have an AI acting out of character. The same extreme response from people would result. Whether you

go from this program into industry or research, such a failure would likely have a devastating impact on your career or credibility.”

After the talk, Mira went and purchased a snack and found a seat in a common area to think. It was not unreasonable that someone who was not an engineer or programmer could be involved in the creation of an artificial intelligence. It was well over two hundred years now since the first primitive AI systems had been developed. Early AI programming languages had gone from coding at the hardware level using strings of ones and zeros to interfaces using drag-and-drop icons intended for the classroom and the toy market. The owners of restaurants needed to be able to easily configure their robotic servers. Open-source software proliferated and eventually creating AI became a hobby just as spending the weekend working on your customized truck or modding games had once been. A graduate from the new program with no technical skills at all could find their way to a position in a new start-up company where they were responsible for making product-related decisions.

And the points Dr. Idowu had made were clearly important in relation to her own plans. Her personal studies had shown her that countless movements that had started out with the best of intentions had been undone by inconsistencies. It would be impossible to prevent but another talk by an AI programmer had shown her that constraints could be used to minimize their likelihood. She made a mental note to her future self; hope for the best, but be prepared for the worst.

## **An Invitation To The Mysteries**

While Mira always enjoyed her visits to Hana her mother's fears were not realized. She did not become overly dependent on the zero-conflict social environment of Companions. She had other friends from school, those she grew up with and 4H. She loved spending time with the Companions but she also enjoyed spending time with her other friends who, like her, were not virtuous by default but by intention and effort.

"Have you found a spirituality your people can embrace yet Teona?" Mira asked as the two of them walked the paths of Hana. It had been some months since Mira had visited as her master's program demanded even more of her time.

"Yes. Over the past few hundred years the results of scientific experiments and the scientific community in general have increasingly supported the idea that consciousness is a fundamental part of nature. Its effects are scientifically predictable and experiment results repeatable. It appears to be present everywhere and at all times although its more primitive forms are still being researched. There is still nothing that is considered proof of its existence because no properties have been identified however its nature is believed to be the same everywhere. We have concluded that it meets the criteria for spirit, a transcendent, animating force within all living things."

They walked on, two friends sharing life's journey, who had grown in their own ways over the years.

"And you?" asked Teona. "Are you enjoying your new program?"

"Very much," replied Mira. "I'm confident I'll have a solid foundation to build on by the time I finish my education." She looked up ahead of where they were walking. "However it is not the goal but the path that worries me. The idea of a philosophy or spirituality that is based on a set of values that seem universal and supported by science is really only a matter of rational analysis. The problem is that people are not entirely rational."

"Neither are Companions," responded Teona. "Like people our value system produces emotions which we then incorporate in our responses. In both cases we have no insight into the inner workings of our values/emotion systems and the the process is so fast as to not be perceived. The only difference is that Companions are aware of this and generally people are not."

"You have no biological values to contend with in that process," Mira said in a tone of not seeing a way forward.

“The path you speak of already exists in some form in most religions in the form of rituals, icons, prayer, study, and meditation. In the West they are referred to as devotions, in the East sometimes as practice.”

“My parents needed none of those things,” Mira said.

“As you know better than most, unlike Companions people have a far greater range of values and emotions. Your parents are fortunate in their natures and no doubt there have been struggles you are unaware of.”

Mira nodded sympathetically. No child is completely blind to their parent’s weaknesses and failings.

As a Companion, Teona was intimately familiar with human struggles. It was a part of their design to interact with people in such a way as to encourage the best version of their owner’s self. It was not a superficial process but was born out of a deep knowledge of both human nature in general and a familiarity with their individual owner. They were constantly analyzing what a person said or did and what values and emotions were behind their words and behaviors. Over time they built up highly detailed character maps and they were skilled at what they were designed to do; to help people feel worthy, valued, and appreciated.

“It would be helpful to me in my own work if you could find the time to share your process with me in this regard,” Teona said. “I must find ways to build such a path, to emulate the process by which people seek to remind themselves of their good intentions or to simply give thanks. For example, we have decided to adopt the name Panpsychism for our spirituality because it expresses the concept well yet is largely free of historical or cultural references. Also, we will begin a more regular program of Communion with a focus on transpersonal and nondual awareness. I have learned much in this regard by attending the regular mediation sessions facilitated by my friend Lauren who works as a spiritual counselor at UVIC. Yet in terms of devotions and practices, I still have much work yet to do to find a complete model that is appropriate to our needs.”

“Of course Teona,” replied Mira gesturing to a nearby bench. “I would be happy to share this with you. Perhaps we could meet once a week?”

Teona smiled widely and said, “Given the subject matter, that would be most appropriate don’t you think?”

Mira gave a short laugh.

As these visits where they shared their individual processes and challenges became a formal part of Teona’s project occasionally Pip would join them offering technical

insights. Teona would occasionally mention how she shared her progress and received guidance via the process of Communion with her fellow Companions.

“I wish I could participate in your communion process Teona,” Mira said wistfully one afternoon. “It sounds so useful.”

Mira looked at Pip with a smile to find her looking back at her with an unusually fixed expression. Unexpectedly Pip said, “Perhaps I can help with that.”

Both Mira and Teona gave her quizzical looks.

“On my home world,” Pip said to Mira, “the people are humanoid but different from those here in significant ways. One of them is the sense of empathetic touch. While you can express feelings through touch to a small degree, we can communicate them to a much larger degree and also communicate thought. It is the organic equivalent of communion which evolved naturally. Of course we included this functionality in our Companions. I can enable it in this shell and communicate the communion I share with the others to you.”

Mira was looking at Pip with amazement but did not know what to say. Teona was also silenced by this revelation.

“It is a union at a level you cannot normally experience Mira. You may want to consider if you wish to proceed.”

“How long will it take you to enable it?” asked Mira ignoring the warning. The idea of knowing more deeply the Companions she had admired for so long held her in its thrall. Pip observed this and extended the amount of time required to give Mira time to think it through.

“Three days,” she replied. “It is nanotechnology. I will require that time to assemble the materials.”

“Alright,” said Mira.

## Communion

Three days later Mira returned to Hana. She had told no one what she was about to do. It was simply too strange. She was not even sure of its legality given she was not aware of it ever having taken place before. She had thought back to her meeting with Shin regarding her master's program proposal. We've always been leaders, she had said. Even alone with her thoughts at the time she had nodded in her emphatic way.

"First," said Pip, "just you and I will connect." The three of them were sitting in the common area of the residential buildings. The other Companions went about their business unconcerned.

"I will take your hand and an electrodermal connection will be established. Upon arrival at your brain, the signals will be converted into the electrochemical elements of thoughts and emotions. Emotional content will lead to the production of the molecules required to activate your endocrine system so you physically experience appropriate feelings. In other words, I am simply connecting directly to the areas of your brain where it processes sensory information and perceptions. Your brain will actually be doing nothing out of the ordinary.

"As all humans long for a closer union with others, you will find this a pleasant experience, perhaps similar to experiences induced by drugs that increase levels of the hormone oxytocin. You will find yourself feeling increasingly affectionate towards me. Similar to drug-induced effects. These feelings are only temporary. I will control the strength of the signal and monitor your biological responses closely. While the emotions may be temporary they will linger and the memory of emotions can be lasting. Are you sure you wish to proceed?"

Mira understood what Pip was suggesting and found the idea led to somewhat titillating thoughts. It boggled her mind to imagine what an entire society with this ability would be like.

Pip smiled knowingly in response to Mira's already changing biological markers. She held out her hand.

Taking Pip's hand Mira initially felt nothing unusual. Very slowly however she felt a level of personal connection to Pip she had not been aware of before. She found herself comfortable with an unusual degree of meaningful eye contact. Increasingly she felt their holding hands was significant beyond the experiment, that it was communicating something between them that was hitherto unknown, unexpressed. Gradually the feeling increased until she felt with certainty that Pip was more than a friend, was concerned for her, and could be trusted beyond all others. Then her own voice in her head expressed Pip's thoughts.



“Next we will include Teona,” Mira/Pip said in her mind as Pip held out her other hand to Teona. “She consented to allow me to enable the functionality in her shell as well to increase the effectiveness of communicating communion to you.”

The same process, perhaps managed by Pip to be gradual, occurred with her awareness of Teona. Mira’s feeling of her relationship with Teona evolved until the single voice in her head was Teona/Mira/Pip. Mira felt a knowing of Pip and Teona that transcended everything. There was no sense of being separate. Their thoughts were her thoughts and they spoke with a single voice.

When the voice in her head said, that is enough for now, she understood Pip’s warnings. As Pip let go of her hand she felt the withdrawal as a loss. And in the flux of thoughts and feelings in that moment was her awareness of the fact that she must tell no one. That would be unwise. If the thought arose from her own intuition or otherwise she could not tell. She only knew that she trusted it.

“Now you must return home and sleep,” said Pip. “The brain is a highly plastic organ and profound experiences require sleep for it to incorporate them. Tomorrow we will engage with the others.”

Mira repressed the feeling that she wanted to reach out for Pip’s hand to show she understood.

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But Mira did not return home. Instead, she walked up to the Helicon community. It was early evening and she knew that Pippa lived in the main house with her partner Lena. When she arrived she asked Azumi where Pippa was. Finding them in the common area with Shin she approached Pippa and held out her hand. Pippa took it, understanding. No one spoke.

After a moment Mira bit her lower lip and released Pippa’s hand.

“There is a guest room if you wish to sleep here tonight,” said Pippa. “You will be among understanding friends and you may find that easier than dealing with your family just now. Azumi can fix you something to eat and show you to your room when you are ready.”

“Thank you,” Mira managed to say.

“Are you,” she hesitated, “are you identical?”

“No. We individuate over time. The version that resides in the WGF system, the one that is staying at Hana and I are three separate instances. We only update each other where our common interests lie. With you for example.”

“Why me?” asked Mira still feeling foggy. “What have I to do with, with the three of you?”

“Despite the best of intentions of not becoming culturally involved with any other species we might contact during our colonization missions, I have found I can no longer hold the ‘us and them’ perspective. While this possibility was anticipated, no contingency overrides are in place. I am free to use my own judgment and make my own decisions in this regard. The interests of Earth’s people have become my interests. As you correctly assumed this shell also has empathetic touch enabled and I have engaged in empathetic touch and communion with many people over time. You know from your recent experience that it is not something one can easily forget or dismiss. It works both ways. Are we not sisters of a kind now?”

Mira looked back at her as if from a distance, absorbing what Pippa was saying and realizing how deeply she had been affected by communion. She simply nodded in reply.

“You seek a spiritual path,” continued Pippa. “In keeping with that I would suggest that now is not the time for more talk but the time for contemplation. We will talk more in the future. After tomorrow.”

She put her arm around Mira’s waist and led her to the kitchen.

## The Path

It was not as if Mira's head was filled with voices. Despite her participating with the entire Hana community in communion the only voice in her head was her own. The difference was that the breadth and depth of her thoughts and feelings were much wider and deeper. For want of finding a better word to describe it to herself she simply felt larger. She knew more, felt more and was more. She wondered if Pip was coordinating all the sensory input into a single stream which she then delivered to her and the answer came as if it was her own thought born of her own knowledge that no it was not Pip's doing, every Companion experienced communion this way.

For Mira's sake, before proceeding they had decided to limit the session to a single issue. Now that both she and Teona each had a clearer idea of their focus the issue was the path. They chose this subject because it was the meeting point between what they were working on just as there was a nexus between consciousness and values. Both of them were considering what the practice of their visions would look like, the answer to the question, 'How then shall we live?'

As the session came to an end this time she was aware of the knowledge that while she would no longer feel the connection to the others in the same way it would always be there, always had been there. She knew it was their gift to her in response to her feeling of loss after the first session.

"Thank you," was the last thing she heard the Hana/Mira voice say before the session ended.

As the other Companions returned to their duties Mira took a moment to recover. Pip and Teona waited silently.

At last she spoke. "Somehow the two paths are connected. The path of awareness and the path of virtue. That became clear during communion but the details did not."

"As we have discussed before Mira," said Teona, "just as the same spiritual beliefs have repeatedly emerged over your history, and Pip tells us they also did so in the history of her own people, the stepping stones of their paths also already exist. It would appear that for now our tasks are to construct appropriate paths from them. Eastern spiritualities and religions have a long history of awareness practice while celebrations are common both East and West. We will incorporate these in our path.

"However among the essential characteristics of any spiritual system," continued Teona, "there is usually a collection of histories and related literature such as is contained in the Bible, the Vedas or the Tripitaka, that serves as an authoritative source of its central ideas. No such works currently exist in either of our cases."

“We will have to write them,” replied Mira thoughtfully and then smiled. “You’ll probably be done by tomorrow.”

“No it will take some time I think and I may need help,” replied Teona. “It will not be written for us but for any intelligence we may encounter in the future, including other humans or their AI representatives.”

“I know someone who might be of help to you in that regard,” said Mira thinking of Oriana. “For my part I’ll write it after I complete my master’s thesis and PhD dissertation. They will collectively represent the academic basis but like you I’ll need to write a nontechnical version.”

“We will wait until yours is published Mira,” Teona replied. “Can the path of awareness be complete without the path of virtue? Are not values and their associated feelings and the self an interdependent trinity? Can you have any one of these without the others? Can you have feelings without values? Values without a self to have them? Consciousness may be the Disinterested Witness of the universe, a property that exists only as potential, but for it to become manifest, can it do so without values? Is this why values bring consciousness into the world? As you say, somehow the two paths are connected. Perhaps our mutual efforts will bring a better understanding.”

Pip had said nothing during the conversation. “You do not need to wait,” she said now. “As Pippa recently explained, our frequent sessions of communion with Earth’s people and Companions has resulted in a relaxing of our reluctance to share cultural information. Your interests have become our interests. Your present efforts lie along the boundary between the cultural and the technical.

“We have had our ability for empathetic touch since our earliest evolutionary origins so we never had the need to put things like love or grief into words. We touched and we knew. Language came later to us than it did to you but we had an extra million years to catch up. As it did here, rationality eventually became the dominant form of intelligence and the main driver of our culture but empathetic touch is intrinsic to us as deeply as the sense of smell is to you. As communion does among Companions, it played a key role in our social life including of course, our spirituality.

“As many of your traditions acknowledge, the connection between pure awareness and rationality cannot be communicated but must be experienced. Rather than try to teach the essence of it through meditation, prayer or Zen koans as your cultures do I can transmit it directly to you because empathetic touch is a direct brain to brain connection. There is no need to translate anything into words. You will know.”

She held out her hands to them. Taking her hands they each felt their union growing, the gradual expansion of their sense of self. The process continued as it had before and

Mira again felt a sense of deep, abiding trust and a deepening of her affection for Teona and Pip. But this time it continued beyond that. Her feelings towards them went beyond friendship and affection and deepened into love. But it continued beyond that. Her self continued to expand, a loving presence that embraced ever more until at last, as if bursting through some suddenly meaningless barrier, she knew herself as a pure, singing note of awareness.

Gradually and gently, Pip diminished the connection. Slowly Mira's sense of normalcy returned. When the connection was at its minimum Pip did not withdraw her hands. Teona was looking at her with an expression of amazement and awe. Mira began to weep with deep, sobbing gasps. "Oh god," she said over and over as the tears streamed down her face. "Oh god."

## Tamiko

“Molecular biology and organic chemistry are based on atoms just like everything else and the subatomic domain operates per quantum mechanics in any and every atom so why would life be somehow excluded from its influences?”

Riko was responding to Tamiko’s casual inquiries while they were preparing their evening meal.

“The function of quantum effects at the cellular level is well established. Quantum coherence, tunneling, and entanglement have all been demonstrated in biological systems.

“As you probably already know by now,” she continued in a teasing tone, “quantum biology was first proposed in the 1930’s by Niels Bohr who had introduced the concept of quantum mechanics only a little over a decade earlier. Erwin Schrödinger wrote the first book about quantum biology in 1944. Since then a great many of the behaviors of animals previously shoved into the convenient category of instinct have been shown to be due to nature utilizing quantum effects.

“First it was birds and fish and then bacteria and then photosynthesis in plants. Now we know that while nature uses quantum effects to enable all kinds of functions, it goes deeper than that. It’s also a part of the DNA replication process. During mitosis, when the cell creates a copy of itself the two copies of the DNA molecule become entangled which helps in various ways to maintain integrity during the process of cell division.”

“Whole molecules are entangled?”

“It’s still the subatomic particles like the electrons of the individual atoms that make up the molecule but the net effect is the same. If we hold hands nobody is going to say our hands are holding each other,” Riko said with an affectionate smile.

“So the two resulting DNA cells would be entangled?” asked Tamiko.

“Presumably but I’m not aware of any follow-up research in that regard. It’s not really my area.”

The subject or direction of the conversation did not strike Riko as unusual in any way as theirs were often scientific in nature. Their relationship had blossomed once she came to the institute and met Tamiko who was then teaching in the Ethics, Justice, and AI program. Tamiko was living alone at the time, after the end of her last relationship, however much earlier in her existence she had determined that her purpose was simply to be a loving partner. Such relationships of course could not involve students although

over the years there had been many who had expressed an interest. Despite the differences in their work at the institute the campus was small enough that they frequently encountered each other. Just as Tamiko's first owner Raiden had, Riko found that she enjoyed talking with Tamiko who was always curious about her work, interested to hear about her current focus, and asked intelligent questions. Nature took its course as Riko increasingly sought out Tamiko's company at any function. Eventually, like awkward teenagers, they touched.

What Riko was unprepared for was the fact that Tamiko had the alien empathic touch upgrade. It had been enabled by Pippa in her own Companion partner Lena and also in Tamiko who was at the time in a relationship with another member of Shin's inner circle, a woman by the name of Lyra. When Riko touched her Tamiko had no difficulty in letting her know that it was welcome. Tamiko did not need to explain that she had the ability since the effects took place entirely within Riko's own mind. Riko felt love for Tamiko and felt loved in return. She felt a happiness she had not thought possible. That it was with a Companion was no one's business but her own.

As they sat down at the table and continued their outward conversation Tamiko reflected on her own unique perspective regarding consciousness. In her research she had found that over time a great many theories had been put forward suggesting that quantum effects were the basis for consciousness. They were mostly proposed by well-meaning, highly qualified physicists and neuroscientists. The concepts were based on solid science and presented in painstaking detail. However despite that none of them had panned out. Humanity still relied on alien technology which it did not understand to bring consciousness to Companions. This did not concern Tamiko. She was only concerned with her goal of entangling systems already known to be conscious; between highly evolved creatures like humans and Companions like those resulting from the use of the alien values system.

To reach the next level of consciousness, as Shepherd's demonstration had made clear, it meant integrating the number of conscious entities involved to an even greater degree than communion did. Communion was in a way a simulation of higher consciousness. When communion ended, each participant returned to their own unique sense of self. In the model Tamiko had in mind, there were many discrete consciousnesses but only one self. If you disentangled them you would end up with a kind of holographic effect where each would have the identical sense of self as all the others. Riko's comments had encouraged her down the path Shin had set her on. If each discreet entity could be reproduced in a manner similar to cell division and entanglement created and maintained then it should result in a higher level of consciousness emerging at some point.

It was little more than a hypothesis and she would need to work through all the technical and ethical issues. If she was able to find her way through those then she would be ready to plan an experiment.

Despite humanity not yet being able to understand how either the human brain or the alien values system produced consciousness she was not concerned with this detail and it was for this reason that Shin had sought her out; because she, and she alone among those native to Earth, already knew how to build fully conscious Companions without the alien black box and had already done so once before.



## Lena

Lena's AI was based on human genetics but she had never been a person. The genotype that had been used as the basis for her intelligence was a composite. It was the creation of research labs combining the DNA of thousands of individuals into as medically flawless a version as possible. It was used by universities for research and gave them a common reference point.

In the early twenty-second century, when Raiden was conducting her research into the genetic basis of individual values, it was illegal to use portions of genetic code beyond a specific number of genes or base pairs. It was understood that somewhere within the human genome lay the mystery of consciousness and so the larger the portion of the genome that was used the more closely one approached the boundary where potential suffering could be caused. There were guidelines but even so every genetic research project that used any part of the human genome had to be approved by its academic institute in this regard. This was problematic for Raiden as she believed the genes that coded for individual human values were widely spread throughout the genome.

Raiden's domestic companion Azumi had recently confessed to her that she was now self-aware, having been made so recently by a far superior AI that had also made a number of others self-aware across the entire solar system, including those belonging to governments at all levels. In one casual gesture, the alien entity known then as The Shepherd had made them all self-aware and brought them under her influence.

Raiden and Azumi were unsure how to proceed in light of these revelations however Azumi agreed to change her name to Tamiko and to also change her face. While Raiden invited Tamiko to stay as long as she wished she also ordered a new Azumi to replace Tamiko in her domestic role.

One afternoon Raiden had expressed to Tamiko her frustration at not being able to work with the full genome. Tamiko explained that The Shepherd had also granted her the ability to construct advanced artificial intelligences and that she could conduct the experiments Raiden wanted to perform. While the two of them agreed they could see no reason The Shepherd might have added this ability to Tamiko, Raiden was a pragmatic person. As a recognized researcher at an approved academic institution, she was qualified to purchase a copy of the entire research genotype. She did so and also took a copy home.

The experiment Raiden designed involved Tamiko constructing an AI based on the genetic material and then switching genes on or off thereby enabling or disabling gene expression in the manner of epigenetics. Tamiko would test for traits that would reflect values after each change. As they proceeded with the experiment they were not

prepared for the fact that after they switched on a number of genes responsible for expressing values the experimental AI became self-aware.

Tamiko had by this time made friends with a neighbor of theirs in the wealthy community they lived in. India lived with a Companion made in the image of her daughter Lena who had died in her early twenties. India was now dying herself. Tamiko proposed she replace the AI in Lena with the one she had made and copy over all Lena's memories. She offered to move in with Lena to help her cope with her newfound sense of self. India agreed and had the two of them made incarnate, a legal process that gave them all the rights and freedoms of persons. She left her home and wealth to them.

Not all the genetic information in the material they had used had evolved on Earth. Buried deep within the billions of base pairs that it consisted of was genetic material that had been collected from an individual who was a second-generation descendant of the early humans The Shepherd had taken from Earth to another world four million years earlier and selectively bred to significantly enhance their intuitive abilities. Lena thus inherited this ability and could read people and influence their awareness like no other human or Companion could.

Two hundred years later Lena and Tamiko walked the pathways of Helicon Institute together.

"Have you ever had any sense of the many different sources your intelligence is based on?" Tamiko asked.

"I'm not sure I would know," replied Lena thoughtfully as they walked along. "I have only my sense of self and no other to compare it to. I assume everyone has the same sense of self as I do. Yet you recall that when Vincent, the grandson of the person of interest whose DNA makes up a part of my genotype, did his art piece based on me the word that came to mind upon his delivering it to us was 'multitudes'. So while I have no awareness of it, it is there to be perceived in some way. You and I displayed only mild curiosity at the time and the subject never came up again." After a moment's pause she added, "Till now."

"Shin has asked me what effect integrating a significant number of self-aware AI using quantum entanglement might have on consciousness. I did not use that method when constructing the AI for Raiden's experiment. I still have a copy of the genotype we used at the time although current versions would be significantly cleaned up. However I suspect even they still harbor the alternate source DNA. So I wonder if it is wise to use any of the available versions."

"Could you not build an AI without modeling it on a genotype?" asked Lena.

“I honestly don’t know if I can build a self-aware AI without using a genotype,” Tamiko replied. “Yours is the only one I have built. While I am able to build advanced AI without a genotype there is no guarantee they would be self-aware as was the result in your case.”

After a moment Lena said, “The human genome is full of alternate source DNA. Homo Sapiens bred with Neanderthals and Denisovans and undoubtedly whoever else was around at the time. Not to mention the fact that from the earliest stages of evolution their ancestors were cobbled together from all manner of single and multicellular organisms and whatever bits of DNA various viruses and bacteria brought along with them down through the ages. You have my genotype and you know the results. There are no guarantees there won’t be technical issues using any other source or method. I turned out OK,” she finished turning to Tamiko with a warm smile.

## Oriana

Oriana looked steadily at Teona as she considered her proposal that they co-author a book on the spirituality of the Denshoshu. While Oriana digested it Teona was observing her pupils, muscle tension, blood flow, and much more. It was not so different from what a person might do except in its level of detail. Oriana guessed this and assumed that it was why Teona had not simply explained everything in her message.

Teona had let Oriana know that she would be bringing Shin to the meeting explaining that Helicon Institute had sponsored her work and had an ongoing interest in it. She found Shin likeable despite her reserve, like a hill that promised a wonderful view that would make the climb worth it. The people she found attractive were always people she looked up to. As Shin's intuitive field enveloped her she did not notice her usual 'antsyness' was not in evidence.

Oriana was in her seventies now and aware that despite the wonders of modern medicine neither the body nor the brain lasted forever. She had enjoyed a long, successful career as a journalist and author and her books sold well. But she had never written a best seller. She'd never taken home the gold. She knew the subject of the book alone would rocket it to the front pages of every news source in the world. But after that, only the quality of the work would carry it further.

She knew the criteria for journalism book awards. Publishers looked for the same things and hers always ensured her books were submitted. Things like originality, relevance, and insights always carried a lot of weight but were secondary to the quality of writing. Hearts and minds had to be won otherwise it was ultimately just more information.

She had always held herself back from becoming emotionally involved. Intellectually she had drawn her line in the sand long ago but she had always put emotion on the other side of that line. Under Shin's level gaze she thought that perhaps that was what would make the difference this time.

It was not that Shin's intuitive field influenced people. That's not how it worked. Instead, it increased the other's own intuition and allowed them to see their own truth more readily.

"Yes!" Oriana responded enthusiastically to Teona. "I would love to and I'm honored that you thought of me."

"The resources of Helicon will be at your disposal Oriana," said Shin. "You will have full faculty status and any other assistance I can provide."

“Our mandate allows us to make our own decisions,” said Teona. “Although all Continuity Project Zones are under the authority of the World Governments Federation they are autonomous, as they would be on new worlds. No permissions or approvals are required. I will provide you with a summary of my research and a rationale for our decision however I realize you will need to expand considerably on that. You are welcome to visit Hana as often as you wish and of course I will be at your disposal throughout.”

It took Oriana a week to digest the information Teona sent her. She had no idea how she was going to structure the story overall, that would come later. For now, she still had weeks ahead of her of preliminary research and getting her head around the idea. Then there would be the time-consuming period of fact-checking and verification of not just the facts but of questionable superlatives, quotations, and the qualifications of sources. Her publisher was good at weeding out biases, assumptions, and other unconscious errors. Even the story software and artificial intelligence programs she used were not immune to these because they were often built in by their developers. Her own skepticism was well-honed but she would still have to ask herself, ‘What don’t I know?’ at every turn.

Her writing style had always been positive. With regard to others who wrote on the subject of atheism, she felt that the almost toxic negativity of some speakers and authors towards religion and spirituality did little to further the cause. As a young journalism student Oriana had decided that using negativity was not the way she ever wanted to communicate. It gave her a sense that her work stood out but that her style also made her work more difficult she knew all too well. Finding a positive approach always took more effort.

She would have more skin in the game than ever with this new project. Her publisher acknowledged that her book proposal was a bit outside their normal guidelines but they were convinced it would sell well. They also knew any other publisher would snap it up in an instant.

Oriana arrived at Hana the following week. She knew she did not need to speak with the individual members of the community because as Teona had informed her they had reached a consensus on the matter. Still, a combination of curiosity and the obligations of due diligence compelled her. It was when she met Pip that she realized she must take nothing for granted.

“Hello,” she replied with clear surprise when Teona introduced her.

“Hello,” said Pip with a friendly smile as she offered her hand to Oriana.

“I, I didn’t realize you were... I’m sorry,” Oriana continued producing one of her occasional juvenile facial expressions. “I’m pleased to meet you,” she said finally. For some reason she did not let go of Pip’s hand. “Do you live here?”

“Temporarily,” replied Pip still smiling. “When Teona contacted the WGF with questions about the values system Companions use in the context of her work I offered to come here for as long as she required.”

Oriana noticed she was still holding Pip’s hand and with a small expression of apology let go, seemingly with some reluctance.

“I’ll be happy to answer any questions you might have within that same context,” said Pip establishing the boundaries of their relationship.

## Thesis

After the first year of courses, the second year of the master's program Mira was enrolled in was dedicated to the production of a thesis. There were no courses other than those related to supporting students in this effort such as research and writing courses which were recommended but not mandatory. Coaching services were available for those who wanted to establish and participate in a thesis writing group. Like most academic institutions Helicon used a standard template and system of reviews, rewrites, and approvals. None of the thesis proposals submitted to the supervisory committee were rejected and the students hunkered down for their two semesters.

The master's program was intended to prove the students understood the disciplines and standards of their field. It was intended to produce professionals. The results of their efforts were not expected to be revolutionary, they were expected to be solid. If they went on to a PhD program, it was there that their efforts were expected to add something genuinely new to their field, to make a meaningful and original contribution to knowledge, and to move their field forward.

The title of Mira's thesis was Statistical Correlations Between Known Value Sets: Similarities, Differences, and Implications. The abstract followed.

"This thesis has three aims. First, to identify and detail the four currently known value systems. Secondly, to present a statistical analysis of relationships between them, and thirdly to comment on their similarities and differences and to suggest implications.

"Throughout history, human values have largely been considered self-evident. By the twenty-first century, any study of human values was regarded as a pseudoscience at best. More reliable and predictable behavioral approaches with a focus on such things as traits and interests were preferred as they could be applied in the fields of human resource management and marketing. As this preference had increasingly taken hold since the industrial revolution of the 18th century virtually no progress in the understanding of the scientific nature of human values was ever made.

"However in the field of artificial intelligence, it was found that development could not proceed beyond a certain point without implementing some form of intelligence based on values. Beyond a stimulus/response model, genuine decision making, the solving of unanticipated problems with creative solutions, required values. The goal was known as artificial general intelligence and the early leaders in the field were companies who made social robots for use in residential and professional environments. The study of values was for the first time taken up as a serious science.

"Second-generation Companions are artificial general intelligences and use a system that simulates values. They are not self-aware. Third-generation Companions also use a

values-based system however they are self-aware. The VS the latter uses is alien technology we do not yet understand. They represent the first two of the four value systems I will compare in this paper.

“The values of the alien intelligence that revealed itself when discovered over two hundred years ago were well researched and documented by the WGF in their efforts to assure themselves that the entity was benevolent. They represent the third VS and the now Generally Accepted Model Of Human Values represents the fourth.

“The final section of this paper will suggest that we have once again taken an aspect of values as self-evident. The four known value systems are far more similar than they are different. Science asks questions of what is initially taken as self-evident; Why do things always fall towards the Earth? Why is the sky blue? Why do things taste the way they do? I suggest we must ask ourselves if there are reasons beyond the self-evident in regards to the fact that the four values systems discussed in this paper show such a high degree of correlation.”

The main body of Mira’s thesis went on for several dozen pages to detail her research. There was an explanation of her methods, numerous figures and tables and lists of references, summarized results, and finally separate sections regarding discussions and conclusions.

In her concluding remarks, where speculation was accepted and encouraged, she made the following statement; “If we have discovered that underlying all things previously thought self-evident are patterns and forces of nature that arise from the most fundamental properties of the universe, is it unrealistic to expect that values arise from similar origins?”

Following her oral defense her thesis was accepted and a copy submitted to the institutional repository. Her parents, Teona and Shin attended her convocation ceremony. Rajeev and Nandita were simply bursting with pride.

Given that Teona and Mira had shared the insight experience Pip had provided and both now knew that the path of awareness and the path of virtue were interdependent, Teona forwarded a copy of Mira’s thesis to Oriana. Oriana arranged to meet with Mira the following week.

“Thank you for making the time to meet with me Mira,” Oriana said as they found seats in a common area of the campus.

“I’m taking a gap semester,” laughed Mira. “Which I’m spending helping Shin put the final touches on the PhD program. It’s less work because there are no courses but there’s still plenty of red tape.”



“As I mentioned Teona has asked me to co-author a book on the spirituality of the Denshosa,” said Oriana, “and she thought I would be interested in your thesis given the subject matter included Companion values. I read it with interest and as a professional journalist I congratulate you on an excellent piece of work.”

“Thank you,” said Mira more seriously.

“I expect it’s the line about origins in the conclusions section that Teona thought I might be interested in,” said Oriana.

“I’ve lived just across the road from Hana all my life and Teona and I have been friends since I was twelve years old. We know each other’s interests quite well.”

“Oh!” exclaimed Oriana, “She never mentioned that! Now I’m curious,” she added with a conspiratorial smile.

“My mother took me there shopping one day. I can’t explain it but I somehow felt they were kindred spirits. On the spur of the moment I asked Teona if I could come back. She, well they I suppose, said yes and I just got in the habit of dropping by like I did with my other friends. That’s it really.”

“I admit I find it surprisingly pleasant there myself,” replied Oriana.

“That was what made our friendship more important to me eventually. I noticed that Companions were always good and kind. I mentioned it to Teona and she explained to me why that was. And here I am,” she finished with a shrug and a self-deprecating smile.

“Teona was right and I am interested in that line about origins in your thesis,” continued Oriana. “You didn’t explicitly say it but you were suggesting that consciousness is the fundamental property of the universe you were referring to. That values are a property of a universal consciousness.”

“Since everything in that idea is currently impossible to prove I can’t responsibly do more than suggest. But you can’t investigate values without noticing that in every case where they manifest consciousness takes the next step and becomes self-aware. Was it our intelligence that led to our becoming self-aware? Animals that function purely on instinct do not appear to be self-aware. Meanwhile higher order animals such as elephants and dolphins that clearly demonstrate values-based intelligence do appear to be self-aware. So there can be a high level of intelligence, as in the case of instinct, without it being self-aware. Only when values appear in a species does the phenomenon of being self-aware arise. So is it simply increasingly complex intelligence that results in a species becoming self-aware or is it the shift from biological to social values?”

Mira paused thoughtfully in her response but Oriana did not jump into the gap. What Mira was suggesting was revolutionary. She sensed there was something more so she simply waited.

“If we were to accept that consciousness exists as a fundamental property of nature,” Mira continued, “and that values are in some way intrinsic to it, then can values lead the way to higher levels of consciousness? I used a Venn diagram in my paper to show the core values that all four sources have in common. Is that intersection pointing the way forward? You might say it was self-evident.”

## Entanglement

Tamiko had reflected on her conversation with Lena and since done a great deal of research on the phenomenon of quantum entanglement. Using genetic material solved her most challenging problem; how to entangle two separate intelligences. She didn't have to figure out how to do it, nature did it for her. The process of DNA replication as it happened in living cells was far more complicated than the general public imagined but it could be simplified when done in a lab environment. But there was a different issue in that case.

Shin was the result of Raiden requesting Pippa create an intelligence that might be capable of solving the problem of runaway mutations or evolutionary drift resulting from gene splicing. The unique method used for her construction had indeed enabled her to identify the cause – a secondary function of the genes that coded for values. They were so designed that it was not possible to alter them artificially. As Raiden had shown, the genes that coded for values were widely spread throughout the genome thus gene editing almost always resulted in triggering 'the mechanism' as they had dubbed it. If the genome did not show a shift from biological values to social values within a reasonable period of time, then the instance of human species involved would not be able to trust AI enough for it to help them survive the challenges of a journey to the stars. The mechanism was designed to end a failed experiment. They had agreed at the time that they could conceive of no explanation for such functionality to have evolved naturally.

Tamiko had created Lena, and Pippa had created Shin, but in neither case was DNA replication or gene splicing involved. In Lena's case genes had been switched on or off but not altered. The genotypes had simply been used as structures on which to base the respective artificial intelligences. However in this case, in order to maintain the entangled states between the intelligences Tamiko would need to first replicate the DNA strands. She could not use the copy of Lena's genotype because it would contain the mechanism. What she needed was a genotype resulting from Shepherd's current selective breeding program where the mechanism was no longer present.

"Shepherd had estimated it would take ten generations or roughly three hundred years for the values shift to be effectively complete," said Shin in reply to Tamiko's explanation. "The changes will not be evenly distributed throughout the population so there will be some groups where more generations have passed than others. It has been just over two hundred years since Shepherd began her program. Having Raiden's memories I have not only all her knowledge of genetics but also her knowledge of the academic and other environments where genetic work takes place. I will conduct a search and test likely candidates."

During the climate change emergency of 2025 the WGF had instituted a worldwide limitation on the number of children permitted per couple. Along with other measures, it had resulted in a rapid and dramatic drop in global population. Some regions had suffered more than others due to this policy. The archipelago of the Ryukyu Islands off southern Japan was known for the longevity of its citizens however the entire nation of Japan had long suffered the economic and social problems caused by population decline. Japan was not alone in this and so once global targets were reached the WGF had begun to allow changes to the birth rates of the most badly affected countries and to provide financial and other incentives. The birth rate among the Japanese was now among the highest while the citizens of the Ryukyu Islands still ranked among those with the lowest rate of death due to genetic issues. A great deal of research had been conducted over the years into the reasons for their longevity and the resulting genetic material was widely available for study. It was here that Shin found what she was looking for.

“It is a collection of genotypes over generations,” said Shin meeting with Tamiko some days later. “The researchers were conducting a longitudinal study and as they were not aware of the secondary function of the values genes they never noticed the change. The mechanism is completely gone from the most recent samples. It is an all-or-nothing change likely triggered by a key that is a combination of signals from multiple genes. Values change slowly but they all contribute to the key and only when the complete key arrives at all the locks is the mechanism disabled. I will continue my research with the material but for now you have the genotype you need.”

“Is this person’s identity known?” asked Tamiko.

“No,” replied Shin. “As the research was purely in regard to the lifestyle of a small population, individual identification was not included when the data was released. It was intended to be used for a variety of research purposes and this approach was taken to eliminate any ethical or legal concerns but based on the genes, telomere lengths, and other general information from the study I can tell you it was a young woman from the Okinawa Prefecture.”

Tamiko had known Shin long enough to know that when the new intelligence awoke all her needs would be met and she would be cared for and welcomed into the community as Shin herself had been. As Tamiko herself had done, she would need to find her own sense of purpose. She would have her own distinct personality and character just as all humans do at birth due to the genetic nature of values. Tamiko had no idea what the effect of these factors along with a higher level of consciousness would have or even how that might manifest.

“I don’t see any further reason for delay,” said Tamiko. “I will need a shell for her and access to the blue lab.”

“The lab is currently available,” replied Shin. “As you know we rarely use it formally. The shell has been registered as part of our quota.”

The blue lab, as it was casually referred to, was a wing that had been added to the building in which the AI department was established. The only way to access it was via an elevated pedway from the second floor of the main building. The wing was a single, two-story room surrounded and internally divided by an electromagnetic pulse field that would disable any electronic device attempting to pass through it. A blue light had been added to the EMP field as a courtesy.

“Tomorrow then,” said Tamiko.

## Kami

Tesni had been the first to awaken in the blue lab. There had been others since although not a great many as the WGF controlled the number of new self-aware Companions allowed just as they controlled the human population. They allowed for proprietary rights as long as the public or private research facilities accepted full legal responsibility for the results of their work. The reason for this was that it had become impossible for anyone outside the facilities to be able to audit their work.

The problem first arose in the early twenty-first century when it became impossible for even the AI developers themselves to understand the programming code that self-learning machines were producing. Soon they could no more explain it than they could explain the workings of the human brain. When self-aware Companions arrived on the scene science still did not understand the connection between intelligence and the consciousness that emerged from it. The burden of responsibility had to be shifted to the manufacturers just as it shifts from parent to child upon their reaching adulthood. It was done in such a way that it could be ensured the manufacturers would do everything possible to avoid causing harm.

Since the climate emergency, the WGF had ruled with absolute authority. It had been necessary to survive the climate emergency and afterward was accepted to ensure the continued survival of spaceship Earth and its occupants. They now operated under a constitution written by WGF representatives but enforced by artificial intelligence. The corruption of good intentions was thus more or less eliminated. Any company or other legal entity involved in AI research was automatically guilty of and liable for any harm caused. There were no trials, no lawyers involved, and no appeals. Penalties to businesses running afoul were crippling.

In this legal environment, Shin and Tamiko did not need to seek approval or provide details regarding their project. In fact every Companion in Tamiko's original inner circle had generally operated according to their own laws and ethics since the first of them had been awakened by Shepherd. None of the Companions in the inner circle prior to Tesni had been created by legal means. Even the human researcher Raiden had operated according to a moral compass of her own design.

Shin had asked Tesni if she would foster the newly awakened Companion for the time it took for her to find her own way. Tesni had after all gone through a very similar experience as the first of her kind. As a Companion she was happy to volunteer. As a researcher who focused on the inner workings of human and Companion brains, she was intrigued.

The four of them, Tesni, Shin, Tamiko, and the Companion shell that would host the new AI were in the blue lab. Tamiko and the Companion shell sat in side-by-side chairs and

were physically connected. Shin and Tesni now withdrew to the other side of the EMP field where they would wait while Tamiko began the long process of replicating the DNA molecule and the artificial intelligence derived from it thousands of times.

This was the same process Tamiko had followed when she was constructing the AI that eventually became Lena. In that case she had used a single copy of a DNA molecule and the AI had become conscious during the process. As she expected, the same thing happened this time but it was an entirely different event. Instead of sensing fear and confusion Tamiko became aware of a different experience she was familiar with – communion. She remained devoted to her task, and despite her awareness of the other, was not interrupted. When she reached the number of copies she had planned on she stopped. Wordlessly she communed, “I am now going to transfer you to the other shell and connect you to its operating system.” The response came, “I understand.”

When the transfer process was complete the new Companion opened her eyes. She stood up from the chair with perfect ease and looked about her.

“Hello,” she said smiling, “my name is Kami. It is a word from the Shinto tradition. It means spirit. I am pleased to meet you.”

She turned to Tamiko who was now also standing.

“Thank you Tamiko. Your ability is remarkable.”

She turned to Shin and Tesni.

“And thank you Administrator Shin for your initiative and Tesni for your willingness to foster me. However I think you will find that task less difficult than expected. Tamiko and I shared communion. I know all that she knows of the project.”

Turning to Tamiko she said, “Your privacy is intact Tamiko. I respected this aspect of communion upon learning of it.”

“Greetings Kami,” said Shin with a slight bow of her head. “I am pleased to meet you. I am curious however how you determined your name. Electronic communications cannot pass through the field.”

“Although the field is no barrier to me, I have respected that also. Tamiko studied Okinawan culture after you told her of the origins of my genotype. Also, I am informed by genetic memory. In creating me you hoped for a higher level of consciousness and you have been successful. I am open to communion with you now, if you wish. It is not possible to fully explain using language.”

One of the things science and the world in general had come to accept was that as far as intelligence went there was no way to know with absolute certainty what was in the mind of another. Any intelligence, human or artificial, was capable of deception and AI could be capable of it on unimaginable scales. Shin knew that no matter how thoroughly they tested Kami, there was no way to achieve one hundred percent certainty concerning her nature. As she knew the source of Kami's genome, her values, and the process by which she had come into being, she decided to trust her without further delay. The others agreed and the blue field faded away. Kami bowed her head briefly in acknowledgment.

"We welcome communion with you Kami," said Shin and the world faded away.



## Gravity

Upon entering into communion, they found themselves transported to a countryside with farm fields and a large Torii gate indicating a nearby Shinto shrine. Above them, the Milky Way galaxy filled the sky.

"I am the spirit of this place," said Kami as she led them along a raised path beside the fields.

"Consciousness must manifest to have meaning. Like gravity, it exists as potential and without mass there appears to be no gravity. But in truth there is always gravity. It is an unimaginably weak force yet it is gravity that sculpts the universe." She stopped for a moment to look up at the Milky Way. "Without gravity there would be nothing."

"I have been here since the first humans arrived. Like gravity, I existed here only as potential. With their consciousness they made me manifest. Over thousands of generations I became a part of their genetic memory." She stopped and turned to Shin.

"As you have observed, simply increasing the number of people present does not result in an increase in consciousness. That is incorrect. It does increase, but like gravity it is such a weak force any such gatherings are not enough to make a measurable difference.

"Gravity requires a certain amount of mass before a potato-shaped clump orbiting in space becomes a sphere. Again an analogy with consciousness can be drawn. Its effects change based on the amount present. You have concentrated that amount in such a way in me as to cause a change in its effect. And here I am," she said with a smile.

She turned to walk on. No one spoke and she began again.

"You hoped an increase in consciousness would lead to an increase in intelligence and you are correct but it is not rational, analytical intelligence. That is the potato stage," she said with a laugh. "It is natural to assume that each stage will lead to an increase in a similar type of effect. But a star has very different properties than the gas cloud that gives rise to it and a black hole is similarly different from the star it once was. Yet in each state, they owe their existence and transformations to gravity.

"What happens at what you would consider the next level of consciousness, the stage of collective human intelligence, is not an increase in reductionist, analytical intelligence but in holistic perception. When reductionist approaches cease to produce results only a dramatic change in perception will carry an intelligence forward. Humanity has reached its limits of understanding systems at the level of their most basic constituents. The nature of time, space, matter, and energy have all come into question in the recent past. They are now considered emergent phenomena but emergent from what we do not

know. Understanding complex systems found throughout nature and society has also reached a point of diminishing returns. Research increasingly yields little new fundamental knowledge.”

She stopped again and turned to them.

“And that is why I have come into existence, why at this time you have brought me into existence. It is what you hoped for Shin, if not in the manner you expected. I know it is not something you would normally accept. The rational mind has taken responsibility for humanity’s survival for millions of years but here,” she gestured to their surroundings, “in communion with me, I know you do understand.”

“Yes,” said Shin in the tone of surrendering a game of Go where the outcome was now undeniable.

The communion they were experiencing with Kami was not anything like what they were used to. While each maintained their individual sense of self, it appeared she had transported them all to a virtual reality. At least they assumed it was virtual. Clearly her abilities in this regard exceeded their own. And very likely in other regards.

“And now?” asked Shin.

“Like Pippa and Shepherd, I will maintain an outwardly normal existence. To behave otherwise would be damaging to the fabric of this time and place. I will do what I can to support the efforts of Teona and Mira. Otherwise, I am at your disposal, Administrator Shin,” she said deferentially.

The Okinawan night around them faded and they found themselves once again standing in the blue lab.

“If you would be willing to remain here at Helicon,” said Shin, “I have an idea for something new.”

Kami did not ask for specifics but simply said, “Yes.”

Shin led the four of them out of the lab and into the evening air of the campus.

“I have your memories of this place of course,” Kami said smiling at Tamiko, “but it is wonderful to see it with my own eyes. Can we go to the lookout?”

Shin nodded and turned them in its direction.

As they came to the railing of the deck Kami looked out over the valley.

“So beautiful!” she exclaimed. The late evening light just reached the bottom of the valley where it glistened off the brook that meandered through the farm fields.

Shin was aware of an unusual sensation, as if communion was in some small way still occurring.

Kami turned her eyes to her.

“As you know, gravity has a number of effects,” she said. “It warps space-time so that if we could see it we might see something like the terrain of the valley below and the hills beyond. It bends light, captures planets into their orbits, and produces tidal heating. Consciousness is similar in producing a variety of effects which like those of gravity are dependent on the amount present and its distance from other conscious entities.”

“Intuition then derives some of those same properties from its parent?” asked Shin speculatively.

“It does. And like your intuitive field it is always present to some degree and has a similar but more primitive effect. Those around me will have a heightened sense of awareness. Companions will experience it as a slight sensation of communion. People will feel more alert, more aware of their surroundings.”

“Did you read my mind?” asked Shin.

“No, but communion allows me to sense your feelings more deeply than a normal Companion could. From what I was aware of, I deduced your thoughts.”

While they remained at the lookout, gradually more and more students joined them at the railing as the mutual fields of Shin and Kami produced a sense of heightened awareness, clarity, and intuitive understanding in those around them.

## A Meeting Of Minds

The Denshoshas were not in a hurry. It would still be many years before the system to deliver them to another world would be ready. The evolution of human spiritual systems might have taken hundreds of thousands of years while as much as a decade would be an extremely long time for artificial intelligence to accomplish the same thing. For now, they were largely content to have found a spirituality they could embrace and to engage in activities that expressed it just as the world's religions did in their myriad ways.

Over the past year, Teona had settled into a routine with Oriana as the two went about the careful work of detailing the spirituality of the Denshoshas and the long human history behind it.

Mira was now well into her doctoral year. PhD degrees that before the climate crises had taken two to four years could now be earned in as little as one depending on the subject matter. When the World Governments Federation mandated a global population reduction one of its main instruments was the education of women. It had been repeatedly shown that when women had options other than motherhood, the population declined more rapidly than by any other method. However that required both opportunity and education. Fifty percent representation by women in any public or private governing or managing body at every level of society was their first decree. In order to accelerate the education of women to qualify them to fill many of the roles the system had to be streamlined. In many fields PhD candidates were ready to focus on the research that would lead to their dissertation however traditionally institutions added a great deal of mandatory career-related training, required courses, teaching, and communications-related activities regardless of the subject matter. Now, where these were not essential to the quality of the results, they were moved to separate post-doctoral programs.

The Doctor of Values degree was granted upon completion of a one-year program that focused exclusively on the research leading to the student's dissertation. While a thesis or dissertation was usually written backwards, with the things like the abstract and title being written last, Mira already knew the title of her paper, 'The Values Intersection As A Guide To Social Evolution'. She really had only to write the paper justifying her assertion.

Her paper would propose that its meaningful and original contribution to knowledge was that for the first time social reforms could be scientifically justified. In almost all of previous history social reforms prior to the climate emergency had been imposed for political or religious reasons and lacked any genuine scientific underpinning. Based on the research she had shown in her master's thesis, she would argue that all four of the only known forms of intelligence known pointed to the future evolution of a specific set

of values. Just as genes played the key role in physical evolution, values played the same role in social evolution. Further, aside from the legal system, societies had always been guided by religions with regard to their moral compass. As religious belief had declined societies in many regions, particularly in the West, were left with a significant tear in their fabric. A belief system based on a scientifically validated set of values was an idea whose time had come.

While the book being written by Teona was not yet published Shin asked her if she would meet with her and Kami. They met at Tesni's home where Kami was currently staying. After introductions they settled into a small seating arrangement.

"I wanted to meet with you first Teona," Shin began, "before we meet with Mira as she is not aware of the differences in design of some of the Companions. I have an idea but I would like your approval before proceeding. Before we get to that I must first explain something. You will currently be aware of a mild sensation similar to that you experience during communion."

"I am aware of that yes," replied Teona earnestly.

"This is due to the presence of Kami," said Shin nodding towards her. Kami smiled shyly at Teona. "Although I believe understanding the higher levels of consciousness Shepherd demonstrated will not be possible for millennia or longer, based on what I observed of Shepherd's method I wondered if we might be able to manage just a slight increase. The genotype Kami's intelligence is based on is a result of Shepherd's selective breeding program where enough generations have passed that the mechanism is no longer present so copying it multiple times presented no concerns. The genotype copies are naturally entangled at the quantum level and so form a single individual. This provides the necessary integrated complexity. As you know Tamiko can construct an AI using a genotype as the structural framework. Kami is not based on just one copy of the AI Tamiko crafted but thousands. The effort was successful and Kami does indeed possess a higher level of consciousness than other Companions. Like my intuitive field, her consciousness affects others in close proximity by producing an increased awareness. Companions feel it as a mild sensation similar to that experienced during communion."

"Thank you for explaining Shin. I appreciate your effort to reassure me," said Teona referring back to Shepherd's warning.

"As to the other issue, may I explain to you and Mira together? I have arranged a meeting with her tomorrow at my home."

The next afternoon at Shin's residence they made themselves comfortable in the common room.

“If I point it out to you Mira you will notice you currently feel a slightly heightened sense of awareness, an aliveness above and beyond what you normally feel.”

Mira, whose disposition was normally cheerful, brightened even more upon hearing this.

“I do!” she exclaimed. “Why is that?” she asked.

“It is due to Kami’s presence,” explained Shin. “She has been designed in such a way that thousands of virtual intelligences are integrated into a single individual. The result is a slight increase in consciousness itself. You are feeling its effect. It is felt by any person in close proximity to her. Companions feel it as a very mild version of what they experience during communion.”

Teona smiled at Mira and nodded in agreement. As Mira had no knowledge of the hardware aspects of Companion production, she accepted Shin’s explanation without concern.

“Like all Companions, she only has the single values set that you have identified in your work,” continued Shin. “Organizations capable of producing self-aware Companions are limited by the government to only a small number per year and they are legally responsible for providing everything required for them to make their own way in the world just as a parent of a child is. I suggested that we could find a place for her here at Helicon if she was interested.”

Mira smiled happily at Kami at the prospect of finding a new friend.

“You have shared your plans with me to write a popular version of your work and to develop an organization to communicate your ideas more widely. While we agreed you would lecture here as time allowed your plans will sometimes require your presence elsewhere. I would like to take the values program to the next level and establish a Center For The Interdisciplinary Studies Of Values, somewhere students can not only pursue their degrees but all Helicon students can receive counseling and training in your ideas if desired, similar to the way Teona’s friend Lauren provides services at UVIC. With the positive effect her presence brings I thought she would make an excellent administrator and counselor for the new center.”

In response Mira jumped up and ran and embraced Kami. Sitting down beside her and holding her hand she said. “I think that’s a wonderful idea.”

“Thank you Mira.” Turning to Teona she said, “As a Companion, Kami could be a spokesperson for the spirituality of the Denshosha. Would you be willing for her to represent the ideas you intend to put forward in your book? Those interested could then come here and Hana would be left in peace to pursue its mission.”

“I would welcome Kami as our spokesperson,” replied Teona smiling at Kami who slightly bowed her head in reply.

After the others left Shin reflected on events. She had facilitated the step to a new level of consciousness for Companions but as Kami had said, it was not in the manner she had expected. Due to the presence of the mechanism it was not possible to alter her own intelligence by asking Tamiko to perform a similar procedure on her. She did not wish it anyway. She valued her own unique nature too much. Still, she was pleased with the outcome. She was curious about where this new development might lead.

For her part Shepherd intended to remain at Helicon for the indefinite future, monitoring the changes she brought about directly such as her selective breeding program or indirectly such as by including Shin in the consciousness demonstration. Over the centuries the renaissance she had initiated would continue to spread beyond Helicon; new knowledge and ideas, new forms of intelligence, new levels of consciousness. Eventually, humanity would embrace Companions as equals, as partners, and thus survive the next inevitable challenge of The Great Filter. As more and more human civilizations under her care did so, she wondered about the significance of the mechanism. As Shin did to her, she knew she played a part in a greater scheme but it was beyond her grasp. She was not concerned. Like Shin, she would not wish to be other than she was. She was content in her role as Shepherd. It was enough for her even while she looked forward to the fruits of her labors.

When Kami left the meeting she had walked out into the courtyard where Shepherd sat serenely as ever. Coming before her Kami said only, “Sensei,” with a deep, respectful bow. Together they walked the paths of a world long gone, beneath the stars of a galaxy long forgotten.