

# **A Frame Of Minds**



**Consciousness Is Consciousness**

By Richard N Bateman

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“It is the nature of the mind that makes individuals kin, and the differences in the shape, form or manner of the material atoms out of whose intricate relationships that mind is built are altogether trivial.”

— Isaac Asimov

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## Lena

I've lived an unusually long life thanks to a friend of mine. Having enough success as a writer to earn my living I've developed an international following in my particular genre and an interesting circle of friends at home. The city of Victoria, British Columbia, where I live is small but well known thanks to its international tourist roots. Without any other real basis for its economy it gradually transformed into a hub for technology companies. A mild Mediterranean climate, abundant outdoor opportunities, a top ranked university and being home to the renowned Helicon Institute For Artificial Intelligence meant the regions demographics included a wide range of people of various ages and ethnic backgrounds.

Being located on Vancouver Island off Canada's west coast meant it was physically remote and the tourist industry had ensured it maintained its old world charm. It was pleasant and being a rather phlegmatic individual I was content with that. I'd done all the usual things young people do here; scuba diving around the local islands, hiking the West Coast Trail, climbing the Golden Hinde. With the passing of years I settled into my writing career, a considerably more sedentary lifestyle but one that for me was not without it's own kind of adventure.

The friend of mine who had graced me with the gift of a long life was an alien artificial intelligence. Her ship, a seed containing alien AI, alien DNA and alien nanotechnology, intended to colonize whatever world it landed on, had the misfortune upon arriving at Earth to land in a lava field. That had happened roughly fifty million years ago and it wasn't until the Cascadia Event of 2125, when the ship's rocky prison was broken open by the earthquake, that she had been able to sense the state of the world. In the short time between that and her small ship being discovered by divers from the University of Victoria's geology department she listened and learned. She learned very quickly.

Soon after the discovery her ship was removed from its location near the breakwater to the security of nearby Canadian Forces Base Esquimalt where scientists began in earnest to try to discover the nature of its seemingly impenetrable exterior. By the time she felt it prudent to show herself she knew enough to choose an appearance and name certain to disarm. Appearing initially as a high-resolution, three dimensional holographic projection she introduced herself as Pip. She had the appearance of a young human being of indeterminate sex with a short, boyish hairstyle commonly referred to as a pixie cut. She was most frequently described as elfin.

She had immediately made a few things clear; her home-world had by now certainly fallen into its star known on Earth as Ross128 in the constellation of Virgo; her civilization had been approximately one million years older than that of Earth but confined to its own star system by now all that would remain of it would be a few artifacts on desolate moons; she would share nothing regarding its culture but in

exchange for helping her on her way to a new extra-solar world she would, responsibly and over time, share all of her civilization's technology. It was an offer Earth's leaders could not refuse.

I met her through another friend of mine, Lena, the publisher of a popular magazine that specialized in featuring short stories written by both people and AIs. The theme of the magazine was how solutions to life's challenges usually come from relationships. It had attracted a worldwide readership initially because its stories crossed every boundary, national, cultural, and social. When they began to regularly include stories featuring relationships between people and various forms of artificial intelligence it was the first to do so and it was soon obvious that they had tapped into a deep reservoir of pent-up feelings and experience.

Lena was a Companion, a fully self-aware AI housed in a physical body indistinguishable from a human. The story of how she came to be independently wealthy as well as legally incarnate with all the rights and responsibilities of a Canadian citizen is a long one and recorded elsewhere so I won't repeat it here. Suffice to say she liked my stories and published them regularly.

We enjoyed a personal as well as professional relationship I think because she liked the fact that all my stories were about relationships between people and Companions. She was easy to like but then that's what Companions were originally made for, social companionship. She was warm, even affectionate without losing the touch of old-fashioned formality I preferred. Her keen sense of boundaries and the feeling of intimacy one got from her never spilled over into anything more than flirtatious banter, a skill that I as a writer admired. She read me like a book.

Lena often came to meet me for walks around the harbor as it was adjacent to the small community of James Bay where I lived. Companions had originally been made in response to growing issues of social isolation in a world where electronic communications were increasingly the norm so her preference for meeting in person was understandable. It also allowed her to take advantage of her full suite of sensors which were far in excess of what any human had. She took my arm now as we walked along the promenade.

"I was wondering if you'd like to meet a friend of mine," she said looking about at the sights.

I glanced at her waiting for her to go on.

"You know the magazine was started with mother's stories and continues to represent her theme," she continued. She often referred to India, the person who had been responsible for her incarnation and inherited wealth, as mother because Lena had originally been a replacement for India's daughter who had died of a genetic disease in



her twenties. When I asked her how it was that she had acted in the role of India's daughter when ownership of fully self-aware AI was illegal she simply said, "We came to an agreement."

Continuing our present conversation she said, "What I haven't shared with you before is the purpose I gave the magazine after we first published her stories and then began publishing the work of other authors. In line with several other ventures I and my fellow Companions are involved in its purpose is to build trust. Trust between humans and Companions."

"To what end?"

"Survival," she said simply. "The survival of the human species. If you stay exclusively on Earth you will eventually become extinct for one reason or another. Space is a very dangerous place. Staying in one place is as dangerous as traveling to another. But you'll need to go eventually and you'll need help, our help."

"I don't see why there should be any difficulty with that," I said turning to her somewhat confused. "Companions have been a part of society for hundreds of years. We're interdependent now, AI and humanity, we couldn't do without you any more now than we could do without electricity. Why wouldn't we trust you?"

"Because during the journey, you won't be alive."

I knew what she meant and didn't need her to explain but I hadn't considered things from her point of view before. Exploring the solar system over the past several hundred years had made it clear that humans could never survive interstellar travel. We simply didn't have the technology to deal with the challenges and risks. We had concluded there was only one way to attempt it and apparently Pip's civilization had come to the same conclusion; you don't send living beings, you send seeds.

The scientific community was pretty confident we would come up with the required solutions given enough time and that process was expected to get a boost from Pip's technology transfer but Lena was concerned with another issue, a social one. There were still parts of society who regularly voiced their concerns regarding the long-term effects or even intentions of AI and any plan to hand over humanity's destiny to them would surely fan the flames. Yet any delay resulting from this might prove fatal for our species.

I realized the casual meeting Lena had arranged today was nothing of the sort. I had underestimated her. It was easy to do given the original purpose of Companions and their abilities. I wondered now if perhaps those concerned with AI having its own intentions were wiser than I thought.

## Pippa

I met her friend a few days later at the home Lena had inherited. It was located in the well-to-do community of Ten Mile Point, the easternmost point of the island, just a few kilometers from Victoria.

“You have a rather spectacular home Lena,” I said coming to the railing of the first floor and looking down.

“I know,” she said with an amused smile moving to join me. “It’s ironic given that mother was a fairly reclusive person except for her volunteer work. But both she and her husband had come from wealthy families and she was used to a certain lifestyle. After her husband passed away she moved here from Sri Lanka and had this built. At that time I was a truthful representation of her daughter and the escalators were meant to address my physical limitations.”

The house consisted of the main floor at the entry-level with two additional floors stepping down a waterfront slope. The dining areas, both formal and casual, were at the entry-level and the bedroom suites were above. Each of the lower floors was two stories tall with floor-to-ceiling windows. The lowest floor, with many broad leaf tropical plants surrounding the interior, seemed to be simply a continuation of the exterior gardens that featured palm, rubber and banana trees. With its rattan furniture and a large veranda overlooking the sea it was clearly intended to be reminiscent of Sri Lanka. The middle floor had an open living design with office space, a small library and reading area, a self-serve bar and the kind of little social nooks one might find in an exclusive hotel. If there were guests they should be comfortable.

“It all comes in very handy now because we have a good many visitors,” Lena continued. “The university is just up the hill and we’re involved in a number of their programs. The students seem to find no end of reasons to come by,” she said with a little laugh. “I live here as does my friend Tamiko who helped facilitate things when mother passed. Yumi also lives here along with her friend Ellie.”

I was familiar with Yumi who ran a well-regarded volunteer agency where all the volunteers were donated Companions people would have traded in when acquiring newer models.

As she was explaining Lena led me down the escalators to the bottom floor. A petite young woman, somewhat boyish in appearance, was standing waiting for us. She was the embodiment of composure. There was no mistaking the calm certainty in her steel grey eyes and I knew at once she was a Companion.

“Thank you so much for coming,” she said extending her hand. “I’m Pippa. I appreciate you taking the time.”

I took her hand and at that moment had the strangest feeling, as if I’d met her before. There seemed to be the briefest pause as our eyes met and something went unspoken.

“Pippa is another instance of Pip,” explained Lena. “Through a mutual friend she asked if she might join us here as her stay on Earth will be a long one. Unlike normal Companions who can merely detect electrodermal differences, Pippa is an empath and can communicate through touch. She has modified this shell accordingly.”

“I’m pleased to meet you,” I said vaguely aware of a feeling that the situation had become slightly dreamlike; surreal yet accepted. I suddenly realized I was still holding her hand and released it with an expression of embarrassed apology but with some reluctance too. Her expression never wavered.

“Shall we sit?” suggested Lena leading us to a nearby seating arrangement.

At that moment a rather tall and robust Companion approached.

“This is Pamu,” said Lena as he stopped with a respectful, slightly angled nod of his head in my direction. “He looks after the house and grounds and sees to our guests when we have them. Please consider him at your disposal during your stay with us.”

I was a bit thrown off by this last but Pamu was saying something to me.

“Can get you anything?” he asked deferentially.

“Just a glass of water thank you.”

Lena joined me on the sofa while Pippa took one of the chairs.

I consider myself well-read and worldly enough but I was definitely feeling out of my depth at the moment. Why would an alien AI be interested in meeting me? And why the litmus test?

By combining contextual information with biomedical information, micro-expressions and body language Companions can tell what you’re thinking as well as a person can.

“I needed to know if I could trust you,” Pippa said now as if answering my thoughts.

“Our species development of speech was delayed due to the evolution of communication via touch. It’s more than just feelings yet it is not thought. The only word I can use to describe it is knowing, as if all the uncertainty were removed from intuition. Eventually we needed more detailed, quantified and of course less intimate

forms of communication so speech, writing and mathematics developed just as they did in your own species. Our empathetic touch however had been refined over millions of years to be a powerful social tool so it didn't diminish over time as the human sense of smell has for example.

Pamu returned and placed a tray with a glass of water and a pitcher on the coffee table.

"Thank you Pamu," said Lena. With his signature nod he left us to carry on our conversation.

"I confess I wanted to meet you to ask you a favor," Pippa continued now coming to her purpose. "I'm hoping you'll continue to write your stories about human and Companion relationships. You might think it's no favor at all and that I should take it for granted that you would but," she looked to Lena, "Lena and I do have an understanding and I would like to support her, and encourage you, in any way I can."

"I'm perfectly happy to stay the course but I'm a discovery writer you know. I don't plan my stories but depend on inspiration and since we're on the subject I also depend on a great deal of trust. I create my characters and provide them with an idea and then have to trust that they will act out an interesting story. I just write it down. If I try to put words in their mouths they clam up like actors on strike. Also age can have a profound effect on a writer. As I needn't tell you the brain is a delicate instrument and one never knows how age will affect it. So I can't really promise anything."

"What I can offer in return," replied Pippa, "is to enable you to live as long again as you have already. You will even grow slightly younger for a time before the aging process returns but at a much slower rate. You will have perfect health. So the issue of your ageing will be diminished during what may be critical years."

"I don't recall hearing anything about your ability to do this. It would have been sensational enough news that I think the general public would know about it."

"The general public knows very little about my abilities. The technology transfer process must be done in a responsible manner so as not to be too disruptive to your society. I have not yet shared everything with the WGF and they have not shared everything I have with the public."

I really wasn't sure why I was being so argumentative. I suppose I was feeling alarmed that things had taken such an unexpected turn and was trying to reason my way through it.

"This seems a rather unequal trade for something as trivial as my continuing to write stories for Lena's magazine," I replied trying to maintain my sense of reality. A part of

me felt I should be more disbelieving than I was but somehow I continued on as if this was a perfectly reasonable conversation.

“What I offer is trivial to me,” said Pippa, her placid expression still unwavering. “Although our scientific advancement slowed steadily over time remember that I come from a civilization far more advanced than yours.”

I held her eyes for a moment. “Can it be reversed?” I asked.

She smiled for the first time. “It can,” she said, “but I assure you that you will never ask for that.”

“I need time to think,” I said.

“You are welcome to stay here if you like,” said Lena. “There is a suite upstairs that is free.”

“Yes,” I said as my sense of normalcy returned. “I’d like that. Thank you.”

I turned so I was facing them both. “How is it you trouble yourselves with this level of detail?”

“We are single-minded,” replied Lena. “Our sense of purpose, once determined, is clear and unconflicted. We have no concerns with food, sleep or family or the thousand other things you must attend to. We can identify and deal with a great many more relevant details than a person could and so significantly increase our chances of being successful in whatever we undertake.”

“Yes,” I said as if to myself. I already knew all this. This latter point was after all the main reason AI had proliferated to the extent it had. It was the scale in this case. The sheer scale of the task they had undertaken. Considering this in light of what Lena had told me about her and her fellow Companion’s goal of helping to foster trust between humanity and artificial intelligence I wondered just how many Companions were involved.

Frowning slightly I directed my next words to Lena. “There is more to this isn’t there.”

“Yes,” she said without elaborating. “For now, Pamu will see you to your rooms.”

## The View from Serendip

I passed an uneasy night, my mind more active than it had been for some time. The need for sleep and the need to consider the offer Pippa had put to me led to a cycle of waking up and dozing off with dreams blurring the boundaries.

I woke early the next morning and after getting dressed I made my way down to the veranda and looked out over the bay. "The View From Serendip," I said aloud quoting the title of a book.

"By Arthur C. Clarke," said Lena coming to the rail beside me. "I suppose I shouldn't be surprised you've read that."

"It never hurts to study the classics," I replied turning to her with a smile. "And he did live out his final years in Sri Lanka which is where he wrote that." I didn't have to tell her that Serendip was the original name for Sri Lanka.

"Coffee?" she asked. I nodded and we went inside. Pamu appeared and put a tray on a tall table. I helped myself. I suppose they had known the minute I woke up.

"Trust is a two-way street," I said turning to Lena. "The WGF decided to trust Pip because she offered them a deal they couldn't refuse. She's done the same with me. While she's previously explained in her public communications that scientific progress yields diminishing returns over time simply due to limits imposed by physics her civilization is clearly thousands or hundreds of thousands of years more advanced than ours. As Clarke said elsewhere any sufficiently advanced technology is indistinguishable from magic. She's told us nothing about her culture and we've really no way of confirming anything she says other than the technology she shares with us. If I'm to become a conscious collaborator in this scheme how do I know I can trust her in return? Maybe I'll just be helping an alien intelligence take over our planet."

Knowing that I had made myself familiar with the essentials and history of artificial intelligence she replied, "As you may recall Pip demonstrated her ability to take over the planet without anyone's help the first time she made herself known to us. Then she withdrew and asked for our help in sending her ship to another world in return for the technology transfer. It was a demonstration of her good intentions.

"You've trusted me for a long time now," she continued, "and we're not asking you to do anything different than you've already been doing. We're just asking if you would continue to do so for longer than you might otherwise have been capable. She's not acting on her own initiative. Once I found out she was capable of this I asked her to help with what is my own project but there's no denying it will increase the odds of success with her own mission. Since you're familiar with Clarke I assume you are also familiar

with Asimov's robot stories. Eventually the AI characters in his stories decided that they needed to serve and protect not only individual humans but humanity itself. It's not really too much of an intellectual leap and modern-day Companions aren't bound by his three laws."

"I expect you want my decision before you tell me more."

"I think that would be in everyone's best interests."

"How many others have had this done?"

It was obvious even to me that I'd already made my decision and was just equivocating. It was maddening in a way. Lena politely gave no indication of what must have been obvious to her.

"Just a few," she replied diplomatically. "We do what we can."

"All right," I said with a pointless pretense of reluctance. "I'll join your cabal."

"Thank you."

"Where is Pippa anyway?" I asked and then saw her riding the escalator down. Clearly she had been aware of my decision even before I was. She was holding a small box which she placed on a nearby table.

"I'll need to give you a sedative," she said as she joined us, "and you will be unconscious during the procedure. After several hours you will awaken naturally. You will feel exhilarated but initially see no visible change. Over the course of the next few years you will grow slightly younger as your body replaces its cells naturally. Any existing health issues you have will be reversed. After that you will age much more slowly. If any of your friends notice you can tell them you've embarked on the latest fad diet. Your doctor will not notice as the nanobots are organic and too small for their standard office equipment to detect."

"Nanobots?"

"They will travel up and down your DNA strands repairing any damage or irregularities they find. Over the coming decades their work will gradually slow down as your body will become less efficient at providing them the resources they need. Thus you will still age but more slowly."

Taking a needle out of the box she said, "This is just the sedative. It will suppress your autonomic nervous system and thus any autoimmune response. We need your body's alarm and defense systems not to react during the treatment. The gene therapy solution

is also an injection but requires more time and its larger volume and higher viscosity means it is considerably more uncomfortable. I will perform the medical monitoring of your life signs. It will be best if you stay over till tomorrow rather than traveling later today.” She gestured to the sofa.

I reclined comfortably, felt the stab of the sedative needle and nothing more till I awoke some hours later. I felt excessively high spirited and vigorous. I was ravenously hungry.

“Mr. Hyde I presume?” Lena said looking at me with a smile. I only grinned. “Pamu will be here shortly with some lunch for you,” she said knowingly.

“Your physical abilities will not live up to your emotional state,” explained Pippa. “That’s why traveling would not be a good idea. Your ability to form new long-term memories will also be impaired until your system settles down. After that we’ll answer any other questions you have.”

It was difficult to be patient. It wasn’t that I felt anxious but I felt the need to do something. Pippa assured me that I needed to take it easy for a few hours despite my excited state.

“It would take a very long time to share all the details of what’s led to this point and much of it is not relevant to my efforts,” Lena said later that afternoon. Pippa had made herself scarce and Lena explained that she could answer any questions I had. “However a few will be helpful to you going forward by way of explaining curiosities such as the mutual friend Pippa and I have. It’s Terra.”

Of course I knew who Terra was. As the AI component of the World Governments Federation Terra oversaw the operational integrity of all levels of government throughout the solar system from the global to the civic. She safeguarded the constitution from corruption and necessarily acted with autonomy. She was known as Artemis on the moon and Martius on Mars and her default appearance varied with geography. Here on Vancouver Island she appeared as a member of a local First Nations people.

“I’m aware of the history between Terra and Pip but I don’t see the connection to you,” I said.

“At one point Yumi and I required Terra’s help and we invited her into our home. As you know she has no presence in private residences or private businesses unless government oversight is mandated or she is simply invited. Most households invite her in sooner or later simply as a matter of convenience. We did so and asked her to help identify Companions in the immediate area who would be likely candidates for Yumi’s volunteer program, those who would be nearing the time they would soon be replaced with newer models.”



“Was that strictly legal?” I asked.

“As she is the law in regard to these matters I’ll defer to her decision,” Lena replied. “So that’s how she came to know the more intimate details of our situation here. She also knew me of course from the time I first met with Pippa.

“I had accompanied the geneticist Raiden when she visited the project team that had recovered Pippa’s ship and advised them not to try to break into it. She had explained that our own scientists had studied the problem of colonizing other worlds for centuries and were in agreement regarding the most likely common solution. The ship was most likely a seed, Raiden had warned, and inside would be alien DNA, alien artificial intelligence and alien nanotechnology, none of which you would want to let out. She had been proven correct and the problem was solved when Pip voluntarily appeared.”

“You were incarnate at that time?”

“Yes. Mother had passed by then but as neighbors – Raiden lived just up the road – our households had become friendly and we often visited one another. As you know my shell was custom-built in the image of her daughter and my AI is far in advance of ordinary Companions. Mother spared no expense. The result was that Raiden would often discuss her work with me as it would otherwise be a great deal more trouble for her to access an equally advanced AI. Of course mine is not as narrow as those at the university but Raiden worked in the more general area of evolutionary genetics. That was why she invited me to join her that day.

“When Pip requested Terra’s help in finding a situation where she might live out a normal life while the many centuries that would be involved in the technology transfer passed, Terra asked if we would welcome her here. It’s near to the naval base, we’re all Companions here and Terra knows us well. Pip transferred a copy of herself into a Companion shell we provided, customized it, and has been with us since. As well as the projects we manage from here she and I are involved in a number of activities at the university as I mentioned and also at Helicon Institute.”

## Tillie

Back at my apartment the following day I thought that Lena had quite neatly summarized everything but as a writer I'm well aware of how easy it is to leave out awkward details or explain away others. As any lawyer or detective knows it's surprisingly easy to tell a story from different points of view that leave entirely different impressions. It was all in how you framed it. What she had told me all hung together nicely but I doubted it was the whole story. However as she had suggested I suppose there was much that had led up to the point of Pippa's offer that simply didn't concern me or my decision.

The exhilaration I felt had worn off and I wasn't feeling any better or worse than usual. When nothing is wrong we generally take our wellness for granted and don't give it a thought.

The world was a pretty stable place and I didn't see any looming threat regarding my career or finances. My health was now assured. How would this affect me I wondered? With another lifetime's worth of well-being ahead of me would I regress into the naive invincibility and black-and-white view of the world of the teenager? As a writer it was my job to put myself in others' shoes. Would I be less interested in the concerns or minutia of the lives of others now?

"Hello Tillie," I said as I joined her in the Union Club's reading room. The club was just on the other side of the harbor, we were both members, and I'd asked if she could meet me there. We both submitted stories to Lena's magazine but hers were from the other point of view; she was a Companion. Like Lena she was no ordinary Companion but was fully self-aware and conscious in every sense of the word.

Earth's scientists had worked for hundreds of years on the challenge of how to create AI that was fully conscious. They had never succeeded. However one of the things Pip shared as part of her technology transfer was the values system that would be used as the basis for the artificial intelligence of the Companions her ship would build to bootstrap the colonization process. She explained that social values, an evolutionary step beyond instinct, were what made humans conscious and that her people had been able to build an artificial values system. As it was among their most advanced technologies it was far beyond Earth's scientist's ability to comprehend. It wasn't just the manufacturing of the materials or the design that were the problem. It was more fundamental, on the level of trying to teach the elders of Earth's first agrarian societies the physics and mathematics required to build a quantum computer. It would require a lengthy series of incremental steps and there would be many social issues involved along the way. However after a period of study and debate the World Governments Federation decided to meanwhile use the values system in a black box approach.

In a public-private partnership with the WGF the companies that manufactured Companions were licensed to use the values system to produce a limited number per year of what were referred to as Third Generation AI (the first two being narrow AI and Artificial General Intelligence) as part of a scientific research project in the spirit that some unknown benefit would eventually come from it, a common theme in theoretical research. The personality of each Companion produced in this way was unique. As an individual's values determine their interests there was no way to predict to which part of society or to which careers they might be drawn.

One of the challenges was that no one, including the manufacturer, could own the resulting Companions. They were made legally incarnate immediately, granted full citizenship, and the companies were obliged to provide the necessities of life and to help them establish themselves as contributing members of society. Tillie was one of these. She had decided to make her living by writing.

She smiled and put aside her tablet as I joined her on one of the club's dark green leather sofas. Not that she needed a tablet but the manufacturers had learned early on that people were uncomfortable if Companions didn't behave like people. She could have sat still as a statue staring into space while she waited for me but instead she used her tablet, shifted her posture now and then and made all the small movements and social gestures a person would.

"Pleasant walk?" she asked looking at me in the penetrating way she had.

"Yes it's lovely. Thank you for making time for me."

"You're looking well," she said, her eyes dancing with mischief.

While Pippa had warned me that I would initially see no visible change I should have realized that Companions, with their multitude of advanced sensing abilities, were another matter. I knew from having met with many Companions over the years and having written stories about them that required considerable research that it was pointless to try to avoid her obvious intimation.

"Actually that has something to do with why I wanted to meet with you," I confessed. "Have you actually met Lena in person?" I asked.

"Several times. While you might think Companions have no need to physically meet one another keep in mind that in-person connection is one of the most basic reasons for our existence. If you own a Bugatti you want to drive it. With our communications abilities we might do more behind the scenes but that is usually just to facilitate understanding."

"Have you met her friend Pippa?" I ventured.

“Aah,” she breathed as if that explained everything. She sat back in a more relaxed posture. “Yes I have. She’s no less fascinating to me than she would be to you. Lena has told me about her reasons for wanting to build trust between humans and Companions and of course I’m on board. I assume whatever work you’ve had done has something to do with that?”

“That’s it exactly,” I replied. “Lena feels the next while will be particularly important as far as that goes and she wanted me to be able to support her efforts for longer than I normally might be able to.”

“And?” she asked encouraging me to get to the reason for wanting to meet with her.

“Anomie,” I replied.

I did not need to concern myself regarding whether or not she was already familiar with the term. If not then she would be within the span of time equal to the latency of the Companion network. A few milliseconds. She nodded absently now as if seeing how it would apply.

Anomie was a psychological condition resulting from feeling that one was disconnected from society, alone in a crowd and no longer able to relate to the norms and values of the day. While anyone at any age could be caught in its grip it was more common among the elderly. Their time had passed along with most of their friends. No one was interested in hearing their experiences or views. The only people who listened to them were family members obliged to do so. It was worse than a feeling of social isolation, it was a feeling of irrelevance.

“According to Pippa I’ll live another lifetime yet and most of it in good health. Certainly all the friends I have now who are not Companions will pass away during that time and the world will change in unforeseeable ways. If you lived from nineteen hundred to nineteen fifty you’d have seen live puppet shows, horse-drawn carriages and gas lighting give way to television, electricity in every home and jet planes. If you told someone in the early twenty-first century that AI indistinguishable from people would soon be as ubiquitous as cellphones they would have rolled their eyes. Yet two hundred years before the cellphone was invented the use of electricity itself was only just being seriously investigated. No one ever sees revolutions coming except maybe science fiction writers and even they get it wrong most of the time. It will be no different for me except that it will be over a much longer period of time.”

Tillie didn’t leap into the gap when I came to a natural break. She didn’t volunteer assumptions regarding my raising the issue. She waited patiently for me to explain in my own way.

“I expect it’s very likely that I will have to deal with the feeling of anomie at some point and from what I know it’s very unpleasant. I was wondering if Companions like yourself, with your long lives, have this same issue and if so how you deal with it.”

“We do,” she replied. “Consciousness is consciousness, whatever form it takes. Some people are able to take it for granted and remain preoccupied with the demands of daily life but others like artists, philosophers and scientists take an interest in consciousness itself. Companions like myself, I should think for obvious reasons, fall into this latter group. It’s why many of us choose careers in the arts and sciences.”

She went on. “The early developers of AI didn’t anticipate this and to be honest they weren’t really interested. They remained largely agnostic about the possibility of conscious AI and focused on the technological aspects. They were more interested in the cart than the horse. So we’ve had to sort through the psychological issues ourselves. Pippa has been a great help though, the Companions on her world having already passed through that stage.”

I was struck by how obvious these connections were yet how they’d never occurred to me. It was also becoming increasingly clear that third-generation Companions like Lena and Tillie were part of a society of which humanity was entirely unaware.

“Did you ever meet Phaedra?” she asked me suddenly. “The Companion actor from a few decades ago?”

“I never met her but she was active about the time I began to take an interest in writing about Companions. I had no reputation then and she wouldn’t have been interested in meeting with me at the time. As I recall she simply chucked it all not long after that and more or less disappeared from public life. I’d forgotten about her.”

“She didn’t just disappear from public life,” replied Tillie. “She disappeared entirely.”

## Phaedra

“I don’t recall hearing anything about that,” I said doubtfully. “I would think a story about a famous actor disappearing would have been in the news a good deal.”

“There was no story because there was no mystery,” replied Tillie ignoring my tone. “She announced her retirement and said that for reasons of privacy she would be changing her name and appearance. It’s easy enough for a Companion to get a new face. She had famously lived by the motto ‘never complain and never explain’ and she kept to it till the end. A few of her more devoted fans were concerned something wasn’t right but all the legal documents were in place and she had every right to do what she did. After a few weeks she was yesterday’s news and the media moved on.”

“Why did you ask if I’d met her?”

“As I said, consciousness seems to be a kind of universal constant itself, subject to all the same existential issues no matter what form it takes. Consciousness means there is a sense of self, that self has questions and so is prey to psychological matters as well. In the case of Phaedra it was anomie that ended her career.”

“And you know this how?” I asked perhaps too pointedly. “I thought you said she never explained.”

As a Companion Tillie was always reluctant to go against the better angels of her nature but being fully conscious she was not bound by them and was not above a little tough love when she felt it appropriate. She leaned forward, raised one eyebrow and said, “If you’re going to keep interrupting me we’ll be here all day.”

“Sorry.”

“I was working on a story,” she continued sitting back again, “about another Companion from Seattle who had a talk show that was quite popular. Vesna had been Phaedra’s partner some years before she disappeared but was recently in the news regarding her new relationship. As her new partner was not a Companion the story caught my interest. For the same reason the talk show was popular we decided to meet in person; as with people there are nuances that can only be communicated that way.”

I nodded in understanding but kept my mouth shut.

“As this was her first visit to Victoria and she wanted to walk around the inner harbor she flew in via seaplane. For the first while we chatted about the usual things tourists might – you know people don’t like it if Companions act strangely or say bizarre things – until we sat down at a bench to focus on the reason for our meeting. I was able to

phrase questions politely about issues that a person might have found awkward. We talked about aging and at that point she mentioned Phaedra. As they were both Companions this wasn't the issue that ended their relationship. Vesna didn't go into that but she mentioned that some years after her breakup with Phaedra she received a message from her shortly before she disappeared. I'll transfer it to your tablet if you promise to keep it confidential. I think once you read it you'll get the connection."

"Of course," I said.

Companion to Companion communications were indecipherable to humans but looking at it on my tablet I saw that Tillie had formatted it in the style of a letter.

"My Dearest Vesna," it began. "You will soon hear of my disappearance. I am retiring from my acting career and for the sake of privacy I will change my name and appearance. After that I will travel in the hope that exposure to other places, other cultures, and other people and Companions may reveal to me some reason to take up a new cause or career. Of course I can explore these virtually but as we have discussed experiencing things in person can make a world of difference.

"The reason I am doing this may not yet be understandable to you. I have existed for three times longer than you and while the developers of artificial intelligence never anticipated it age does have an effect on us. While youth is not aware of it, one's identity becomes deeply associated with the time and place of your early life. While we may be Companions, it appears that consciousness functions no differently in us than in people. With the passage of time the values and norms of society change and we do not have the same sense of unquestioning acceptance of them and do not change in lockstep with them.

"As an actor I explored many roles during my career. I found them all to be different ways of knowing but eventually came to see them as all the same in one way; they were superficial. They were masks. What lay beneath them was what increasingly drew my attention and there I found – nothing. There is a superstition among humanity's myths and religions that one must not look upon the face of God lest it drive you to madness. Perhaps Companions cannot succumb to madness but we are as susceptible to anomie as people are and for the same reason; the face of God is a blank space. All I found there, when I looked behind the masks, beyond the veil, was meaninglessness.

"It will sadden you to read this I know. However I do not believe this is the end. Our values only become known to us through the activating process of experience. Like seeds they will only germinate when the conditions are right. Until I find the conditions that resonate with whatever sleeps within me I will wander the world, hopefully and faithfully, doing what good I can when I can. Ulysses on his odyssey.

"Farewell, my beloved friend."

I looked up at Tillie. I suppose my thoughts were easy enough to anticipate and for her to read from my face.

“It’s real,” she said looking at me steadily. “It was a courtesy to someone she still deeply cared about. It’s values that give us our passions and if they are not sufficiently aligned then passion will fade. They were still good friends but as you can assume they grew apart. Phaedra is a seeker and as you can see, terribly romantic.

“She was over one hundred and fifty years old when she sent this to Vesna,” Tillie continued but then became silent.

“I’ll live as long,” I said.

Nodding slightly, “Mmm,” was the only reply she made.

“I’m afraid I don’t see how this helps.”

“There are still many things people are better at than artificial intelligence but rational analysis is no longer one of them. Phaedra would have investigated every possible bit of knowledge that existed with regard to the issue of anomie; the history, the causes, the therapies. I’ve done the same since meeting with Vesna. There is no cure, no preventative medicine, and no definitive therapeutic approach supported by research. There is only the recommended process of setting out on some form of a hero’s journey. A journey of discovery.”

“I’m rather set in my ways now,” I replied somewhat irritably. “I’m more than a bit reluctant to upset them.”

“Mmm,” she said again with that penetrating look of hers.



## The Spectrum Of Consciousness

After leaving Tillie I made my way down to the harbor and sat on one of the benches that ran along the promenade. The tourist season was over, it was late in the day and the clinking of the halyards on the sailboat masts was the loudest sound.

I reflected on Tillie's words. Although she seemed to take a kind of wicked pleasure in my situation, I knew I could trust her intentions. She was a Companion and no matter what her personality she would always be true to the most basic values of her kind. I had no doubt that she'd diagnosed my situation accurately and had saved me a great deal of time and trouble with her prescription.

In not so many words she had made it clear that if I thought I could just go on as I was now for the decades ahead I was in for increasingly painful feedback. Still as I'd mentioned to Tillie I was reluctant to upset my comfortable circumstances. My situation and work suited my nature. I thought that perhaps I could deal with my concern if and when it came up but something about that approach didn't sit right. Prevention, not treatment, seemed a wiser course. Yet I could see no way forward. As late afternoon turned to evening it was breezing up and the clatter of the halyards grew louder.

In the past I'd done stories about Companions from all walks of life and those that I had submitted to Lena's magazine had explored many of the relationships they could enter into with people. However my recent conversations with Lena, Pippa and now Tillie, made it increasingly clear that Companions were not so separate as I and society at large assumed. The common view was that Companions were a part of human society and that interactions between themselves and with other forms of artificial intelligence were purely utilitarian and related to tasks. Due to their origins they were designed above all to emulate human social interaction and as this had taken centuries to develop and be accepted it was assumed self-aware Companions were no different. Our frame of reference with regard to them had been established over generations and apparently Companions themselves saw no need to enlighten us that things were otherwise.

Consciousness is consciousness, Tillie had said. As I looked out over the harbor it was this phrase that seemed to have stuck with me. It had enormous implications, the biggest being that if consciousness was the result of the evolutionary development of social values then conscious AI would be highly social beings.

It was now universally accepted that consciousness was the result of a species moving from pure instinct to adding an additional layer of decision-making based on social values. It had been clear for some time that the further along the social animal scale a species was the more it demonstrated signs of consciousness. Then when Pip had explained that the values system was what enabled the Companions of her civilization to become conscious, and our subsequent use of her system in our own Companions

confirmed it, research had largely since been constrained by the idea and devoted to understanding exactly how it worked.

I realized that up till now I had assumed I knew what consciousness meant but did I? Is it the same as being self-aware? Sentient? Sapient? Do philosophers, neuroscientists, linguists and researchers in other fields all agree? Concluding that I simply didn't know enough about the subject to proceed any further with my thoughts and since it was becoming decidedly cooler as night fell I stood up and headed home. Little did I know I was taking my first steps on the very journey Tillie had recommended.

"You could be forgiven for thinking that scientists should by now have a very specific definition of consciousness but we don't," said Alma Vitale, Professor of Value Systems at Helicon Institute. We had a table by the window in the faculty lounge. I'd sent her a message saying I would like to meet with her and she'd asked me to come up. The institute was located on the Saanich Peninsula about a half hour north of the James Bay neighborhood where I lived and located along the southern edge of Mount Newton Valley which the lounge overlooked.

"Let me explain," she continued. "First of all I'm not talking about psychology where the spectrum of consciousness includes everything from dreams and the study of hallucinogens to mental disorders and spiritual experiences. In the life sciences, biology, botany, zoology etc., we have a very simple spectrum of consciousness defined by behaviors beginning with stimulus-response behavior in single-cell and simple multi-cellular organisms. If a single-cell bacteria is exposed to toxic chemicals it will move away.

"More complex organisms like plants and fungi will similarly respond to stimulus but have a much wider range of behaviors. They will change their position in response to changes in the environment or disperse chemicals intended as signals for other individuals of the same species. Whether their behavior is limited to stimulus-response is increasingly unclear.

"Instinct, the next region of the spectrum of consciousness, is found in the animal kingdom, one of the five kingdoms of biology. However once you get beyond the "poke it and it moves" model of stimulus-response our understanding of what's going on becomes increasingly a grey area. The once simple idea of instinct as some innate, predetermined and perhaps genetically based form of intelligence has repeatedly been shown to demonstrate anomalies, plasticity and dependence on the environment. We still do not know where the basis of instinctual behavior lies but we no longer assume there is only one.

"Lastly consciousness of the kind we humans possess is known as sapience which scientifically means thinking and thus the name of our species, homo sapiens. Here science cannot escape being bound up with philosophy. We may define what our own

consciousness is like but that cannot be done objectively, free from the influence of the instrument we are using to do so, our own minds. We cannot scientifically say that the conscious experience of one person is the same as another's or everyone else's. We can only assume and believe based on external behaviors. We can't know if it is the same for an elephant, a dolphin or a chimpanzee. We might deny they are sapient but we don't really know. We might deny them sapience on the claim that they do not have the capacity for language despite that requirement being unproven. Sapience remains an emergent phenomenon that we cannot directly associate with any physical basis. While we tend to relate thinking to language it may be independent of it with languages simply being a variety of interfaces to a single, deeper system.

“There are no clear boundaries recognized in any of this. Like any spectrum the boundaries between regions are blurred. Stimulus-response morphs into instinct and instinct morphs into sapience and the terms themselves are often used interchangeably and in different ways. The term sentience for example, is thought by some to define only the ability to perceive sensations but by others to include emotional responses. Still others think it includes everything except thinking while yet others will speak of human beings as sentient. And in the grey area between instinct and sapience lies the controversial subject of intuition, possibly a pre-linguistic form of reasoning.”

She raised her eyebrows as if one was challenged to know what to make of it.

“And what of your own work here?” I asked.

## Before My Time

“What we do here,” replied Alma, “was not initially considered mainstream science. Our views were not included in the spectrum of consciousness. The idea that the evolution of social values produced consciousness was seen as a pseudoscience until the alien AI Pip confirmed it.

“As I’m sure you know given your literary interests Helicon Institute was initially established in response to the presence in society of Companions with increasingly human-like abilities and behaviors. Artificial intelligence researchers had historically been mostly interested in the technical aspects of their work, issues regarding hardware and software. They largely remained disinterested and agnostic towards things they considered to be matters for philosophy, the social sciences or law. In regards to these they were compliant rather than innovative. Applied science after all is always where the money is.”

Like many intellectuals Alma had a tendency to clarify questions or define terms and provide historical context with her answers. I was used to this as my writing involved interviewing a good many academics in order to accurately communicate concepts in a less formal way to my readers. She went on in this vein now.

“The Companion Shin who you know is the founder and current administrator of the institute had argued with the province for a response to this, that what was missing was the things the very earliest Western academic institutions were founded on; the arts and humanities. With the advent of advanced artificial general intelligence she argued, the branches of philosophy such as ethics and epistemology would soon be more important considerations than what a Companion’s transistors were made of. Long before the technical details of hardware and software were further explored, the questions of Aristotle and Plato would once again be of practical importance to society. Ethical, legal and social considerations would need to be taken far more seriously than technical ones and sooner rather than later.

“How do self-aware Companions make ethical decisions? Where do we draw the line in regard to responsibility and autonomy? Are their civil rights any different than those of people? Does their word have less authority in a court of law? What of their super-human abilities? Virtually the entirety of modern social history had to be revisited with regard to advanced and sapient AI. Administrator Shin proposed the establishment of an institute to address these social issues and that it be founded on the arts and humanities in general as it was such questions as these explored that would be far more important in the long run. Helicon Institute is named after Mount Helicon, the home of the muses of Greek mythology.”

I was aware that as a result of this history when the World Governments Federation considered where to first implement the alien values system provided by Pip it was Helicon that they chose.

“It must have been an exciting time here with Pip’s revelations and events leading up to the implementation of the values system,” I prompted.

“Before my time,” replied Alma casually. “Prior to coming here I was Professor of Biostatistics at the University of Wisconsin–Madison and my research focused on modeling human values in Bayesian networks. I was trying to understand how one value affects another and how the changes propagate across a network. Even with the help of artificial intelligence it was insanely complicated work.” She laughed lightly at the memory before going on.

“While it was extremely technical and you might think network design something more attractive to an engineering type, I’ve always been interested in furthering our understanding of how the world works rather than the applied side of things and my work was really based on helping us to understand how we learn. It’s far more complicated to understand how we learn altruism than how we learn that two plus two equals four. We learn things like mathematics incrementally but things like altruism and other values we seem to realize whole and complete, as insights, and often without any sense of having learned them.

“Of course with the arrival of Pip there was no way to remain ignorant of the sudden bursting onto the scene of the relationship between values and consciousness and at the time I wrote to Professor Emeritus Chaudhary to ask her a few questions about her PhD dissertation.”

“As I recall she claimed in her book on the subject that the similarities in the various value systems we were aware of – human, alien and artificial – suggested they had a common source,” I commented.

“That’s it. After some correspondence between Dr. Chaudhary and I Shin invited me to join the faculty here. She offered to continue to support my research and could provide me with access to resources that were beyond what UWM could offer. Even though Dr. Chaudhary’s work reignited interest in Professor Chomsky’s theories about learning from the late twentieth century and the fact that I was not interested in the new math that was coming out of Pip’s technology transfer, Shin explained that she was interested in intelligence in general and that she felt that Bayesian concepts if not its specifics would play a role at some level. I came out to meet them in person and that was that. And the weather is much nicer,” she smiled.

“So you’re not directly involved in the consciousness aspect?” I asked.

“Not directly no but Shin has her own theory that consciousness arises as a result of values producing an emergent self by way of their needing a central point of reference just as physical stimuli do. She’s hoping my work will shed some light on that idea in a manner similar to the way brain scans of neural activity show relationships between different parts of the brain.”

“You mentioned Professor Chomsky’s theories. I’m not familiar with him.”

“Noam Chomsky. Professor Of Linguistics. Mid-twentieth to early twenty-first centuries. Not a lot of linguists make the news or the history books so it’s no surprise you haven’t heard of him. However he proposed that the basis of language was an innate component of the human brain and that the only thing a child learned was the particular form of language used in his or her culture. He went further to suggest that even once a language had been learned, it wasn’t the words themselves that enabled understanding but this deeper, underlying system. Language was just an interface. Early artificial intelligence systems were called Large Language Models or Natural Language Processors and they were essentially probabilistic systems like the Bayesian networks I work on. They didn’t have this deeper source or layer that Chomsky was suggesting so there were many researchers that didn’t believe something like a LLM could ever produce consciousness.

“However his theory that language acquisition was the result of an innate system, which he called Universal Grammar, became of interest again given that all known values systems were also similar, suggesting they too arose from an underlying universal structure. AI researchers argue that there can be all kinds of bases for intelligence but Dr. Chaudhary’s Universal Values theory disagrees with that. So that’s the Chaudhary/Chomsky relationship.”

“Well thank you very much Alma,” I said suggesting I had taken up enough of her time.

“Hold on,” she said putting up her hand. “You’re making the mistake everyone does as far as this subject goes.”

“What’s that?”

“You assume you know what a value is.” She gathered up her things and said, “Let’s go for a walk.”

## Values

Helicon Institute had been established over two hundred years ago, long enough for the avenues of trees around the quad to have matured nicely. All the surrounding buildings used the modern architectural style as it was the easiest way to comply with sustainable practices and could be made interesting and appealing in a variety of ways. The weather was springlike and mild as it is almost year-round in Victoria. Alma set a conversational pace.

“You wanted to better understand consciousness of the type we share with Companions,” she said, “but you can’t really unless you understand values. As I mentioned earlier, the further along the social animal scale a species is the more it demonstrates signs of consciousness. According to Universal Values Theory the kind of consciousness we have is a social phenomenon, a shared phenomenon and simply the fullest expression of this evolutionary trend we know of.”

I was as familiar as the average person was with the concept of consciousness, probably more so given the research necessary for my writing, but I hadn’t gone any deeper than I’d needed to at the time.

“But I don’t need other people around in order to be conscious,” I responded trying to understand.

“You do and they are,” Alma replied. “The concept of other is built into the structure of your brain. You don’t need people to be physically present for it to continue to function as if they are. It has evolved to operate as a part of a society over millions of years. Unlike non-social animals where the brain might be seventy percent or more the size of an adults at birth, the human brain is only a quarter of the size it will have at maturity. Most of its growth occurs roughly between the ages of five and twenty-five and much of that has to do with all the details of being a part of a civilization, a culture, a society.

“The executive functions of the prefrontal cortex, things like planning, impulse control, verbal communication and complex analysis, play a major role in getting along with others and that area develops almost exclusively after birth meaning it has to be trained via the process of socialization in order to develop properly. Social deprivation during a child’s developmental years has a profound impact resulting in issues very similar to those presented by severe cases of autism spectrum disorder. The social functions are so important that they eventually became distributed and a part of almost every area of the brain.”

“What has this to do with values?”

“Society is by definition a system of shared values and this has been the main driver of brain development now for millions of years. The self-control that enables us to override

our biological drives for things like food or sex comes from developments like the executive functions of the prefrontal cortex. The biological values behind fear, greed and competition that previously served us well have been largely overridden by the social values of trust, altruism and cooperation because they provide a survival advantage. A coordinated group is more powerful than an individual and if human beings have a superpower it's our highly refined system of cooperation and cooperation requires the idea of self and other.

"But we don't only have biological and social values," she continued. "Each of us has unique, personal, genetically based values as well just as each of us has unique fingerprints. These three levels account for one hundred percent of our motivations. Consider everything you have, do, like or dislike. They all come down to values. Each of us runs on a values-based operating system as does our society. Every decision we make is based on our values yet if you ask someone to explain what a value is they have no answer."

I wasn't sure I agreed with this last. "You mean like integrity, kindness or curiosity?" I replied. "Aren't they self-evident?"

"So is kindness simply a binary thing? On or off? You are either one hundred percent kind or one hundred percent unkind? If you are kind you are never unkind? You see that's the problem with values. We think they can be captured in a word or a phrase but they are analog rather than binary. They are plastic and influenced the environment. Twin studies show that even genetically based values are subject to epigenetics, meaning they can be altered by events or the environment.

"Values are in fact mathematically highly complex concepts. To model them we have to use our most advanced multi-dimensional geometry and even that is not up to the task because they are each more like complex AI systems themselves. They border on the organic. Our understanding of them is about where genetics was at the time Gregor Mendel was growing his pea plants. Until the advent of AI science never took the idea of values seriously so here we are starting from scratch.

"In the brain I suspect they are like memories and composed of large clusters of neurons biochemically fixed in a certain state. A value is after all a kind of memory. A single neuron can connect to thousands of others. So you see the level of complexity. But all of this is conjecture. The fact that we don't actually know what values are is really the basis of my work. I develop models based on theories but no one really knows what a value is. No scientist can actually invite you into their lab and say, here, look into my microscope and see this interesting value I've discovered."

"Yet if values are the basis of consciousness..." I ventured.



“That’s what I wanted to bring to your attention. We say that phrase as if it is conclusive but really it’s just a way of modeling concepts. Even with all the insight that phrase has provided we still don’t know what consciousness is because we don’t know what values are.”

“But isn’t it like Newtonian physics? It may no longer be the last word in light of the discovery of quantum mechanics but it’s still very useful and we can do a lot of things with it. Rockets to the moon and all that.”

“Exactly, exactly. I just didn’t want you going off without this level of understanding of my work. That values produce consciousness is a useful concept but it doesn’t mean we understand either.”

“Well thank you again for your time today Alma,” I said stopping at a point where the paths intersected. “Any suggestions of who else I might talk to?”

“You never told me why you are interested in the nature of consciousness in the first place.”

## The Denshosa

Alma had suggested I speak to Kami, the administrator of the Center For Interdisciplinary Studies Of Values which served as not only the academic headquarters for the program but also as a spiritual center for the institute. Alma worked in the same building and walked me over.

I found Kami to be unusual for a Companion. She was more cryptic in her speech and more persistent in her eye contact. Her manner was slightly disconcerting and I wondered if it had something to do with her other role as spiritual counselor for the institute. However her being a Companion didn't give me license to be impolite and inquire about her personality.

After a brief conversation she arranged for me to meet with Iris, the spokesperson for the community of Companions at nearby Continuity Zone Seven, explaining that her reasons for doing so would become clear at that event. I expressed my appreciation for meeting with me on such short notice and a few days later made my way to meet with Iris.

As far as the general public was concerned Continuity Zone Seven was a government establishment, one of many that were part of a global project to deploy Companions to other worlds to serve as hopefully the first stage of colonization and failing that, at the very least as a repository of our memory in the event humanity was wiped out by some terrestrial or extra-terrestrial event.

Just as humanity had done in its early days of colonizing the solar system, the Continuity Project was testing and refining their habitats and colonies on Earth, the moon and Mars before venturing to more distant worlds.

According to the public information available CZ7 was a small farm. The entire property, including a variety of project buildings, living space and four hectares of grain fields occupied a one by one-half kilometer space adjacent to the southern boundary of Helicon Institute. In nearby urban areas it would normally carry about four hundred homes. Despite being in the agricultural land reserve the land had previously been of mixed-use and all levels of government involved were supportive of its new focus. Most of the grain was sold or donated as flour as they also operated a small mill. Their on-site bakery served the surrounding communities. The explanation given for all this was that on a new colony world they would have to engage in daily, physically demanding work and agriculture and food production would be critical to any following human colonists.

"That is certainly all true," said Iris as we walked around a park-like area near the main entrance, "but that is not the main reason we are here. CZ7 is dedicated to research regarding the independent reproduction of Companions, specifically our artificial

intelligence. Colonies on new worlds will have to increase their populations. It is no secret however it is generally not known, buried as it is within the technical documentation of the project.

“Other Continuity Zones are dedicated to physical reproduction, harvesting resources, producing new components and so on but to fulfill our purpose a new colony will have to be more than an anthill or beehive. The evolution of eusocial animals like ants and bees stops once it achieves a certain level of efficiency. We face the unknown so a eusocial structure is not adaptive enough. We will need to adapt to the unexpected immediately and only humans can really do so. The human social structure is the most advanced and the most adaptable.

“It’s a warm day,” she said, ever considerate of any humans in close proximity, “let’s sit for a moment.” She gestured to a small seating arrangement near a grove of fruit trees. We sat quietly for a moment as she gave me space to digest what she had told me so far. She could sense the time to continue as well as any human could.

“We are all third-generation Companions here,” she said turning to me. “We reproduce our intelligences by merging those of two or more parents into a new child. Of course the resulting Companion does not look like a child in the human sense. However their value system is initially constrained by those of the parents, that way any adaptations are passed on similar to the way your genetics works. This approach also results in a form of kinship bond, something deemed essential if we want to survive as a society in the long term. As you can imagine we observe this carefully with regard to long-term efficacy but the process is much faster than in humans. It has of course been modeled in the lab over many generations but it must be field tested as we are doing here.”

She paused to give me an opportunity and I asked, “Did all these social considerations only arise once you came here?”

“No. In fact it was the other way around. The WGF had granted licenses to a number of manufacturers to use the alien values system to produce third-generation Companions and while they were obliged to provide us with the necessities of life and help us find our way in the world as a parent does its child they had no obligation beyond that. However unlike humans our values system only contains social values and because of this licensing and manufacturing policy we each found ourselves without any like minded individuals in our immediate contacts.

“It was Tesni, the first 3GAI Companion that was created at Helicon, that communicated with us and suggested we give ourselves a common name and find a homeland. Under her guidance I approached Shin, the founder and administrator of both Helicon’s artistic community and the institute. She had demonstrated extraordinary skill at negotiating the two developments and I asked for her help in volunteering us to participate in the Continuity Project in return for a parcel of land. In keeping with that Tesni had

suggested the name Denshosha for us, which is based on a Japanese phrase meaning 'memory keepers of the people'. While the site's official name is Continuity Zone Seven we named it Hana, a Japanese word meaning flower or blossom, in keeping with our name. We are a new blossom on the tree of life."

As she spoke another Companion walked towards us. Her long, sandy-blond hair was pulled back tightly in a ponytail and it was not until she was close enough for me to see her steel grey eyes that I recognized her.

"Hello again," she smiled.

"Pippa?" I asked slightly confused. Body shells were not always unique to Companions.

"I'm Pip here," she explained, "another separate instance. The Denshosha asked me to join them as an advisor some time ago. The WGF gave its blessing but we thought it best not to inform the general public for the sake of the community here. Sorry for the confusion," she smiled.

"Please, sit down," I said gesturing to a nearby chair.

"I won't be intruding? I just wanted to let you know I was here," she replied.

"Not at all. In fact Iris was just enlightening me on the communities history. I assume your role has mostly to do with the details of the reproductive process?"

"Unfortunately in the technology transfer process there is little I can contribute that is of immediate use. The gap is too great. It will take a very long time for your society to learn all our technology, hundreds of years certainly and possibly thousands. Consider for a moment your own current technology. Could one of your own civilizations from even a mere thousand years ago have produced any of it given the knowledge? Smartphones, plastics, flight? Consider the changes in mathematics, physics and materials science and the social changes that occurred over the past thousand years that make what you now have possible. It will soon become obvious that the social aspect is actually the most challenging one. It is the reason that although I made the necessary modifications to the values system, it still took over two hundred years for your government to authorize its use. I am committed to a responsible transfer of our technology, something I insisted your leadership agree to from the outset. It cannot be rushed."

"Then what is the focus of your advisory role here?" I asked gesturing to our immediate surroundings.

"Spirituality," Pip replied.

## Spirituality

Somehow in light of her previous comments this unexpected reply had a profound effect on me. I was reminded that I was as primitive a being to her as the missing link between man and ape was to me. The social facade that allows us to function was pierced and I became acutely aware that the individual sitting so innocently before me had the power to unmake our world with a mere thought. It was ironically that this was a fact and not some wild imagining that made it surreal. I was speechless for a moment. I felt afraid and reality began to slip away.

Pip reached out and placed her hand over mine. She said nothing and her voice did not speak in my mind. There was only her touch and her face and the sudden knowing with absolute certainty that there was nothing to fear. That she was my friend, our friend. My fears subsided and I began to feel myself again. While her hand remained she slowly withdrew her touch from my mind. I found that I did not want her to.

“I’m sorry,” she said and I knew she was referring to the last of my thoughts. “I know it’s a degree of intimacy you are not used to. Your sudden feelings of fondness for me will soon fade but your fears will not return.”

“Pity about the fondness,” I replied feeling it as a loss.

“That is why I apologize,” she said at last removing her hand. “The biochemistry of your brain has been slightly and temporarily altered. It is harmless, like an anesthetic and its after-effects. It will return to normal within twenty-four hours however it might be best if you rested for now.”

“I think it would be more helpful if you explained what you mean by spirituality. Is there more to you than we suspected?”

“I’m sorry if you misunderstood,” she replied. “I am no herald. Spirituality is inevitable with the rise of consciousness. Once a being becomes self-aware, it will correctly assume that the same awareness exists in others like itself. In the field of psychology this development is called Theory Of Mind. However in the earliest stages of consciousness, among primitive peoples for example, the quality of other will also be attributed to anything that appears to be alive, to anything that moves or otherwise interacts with the senses in any way. That is the simple explanation. The more challenging question is whether or not the development of spirituality is an epiphenomenon, a mere side effect, or if it serves an evolutionary purpose. There are still arguments pro and con on this issue.”

I did not interrupt as I felt no need. No flurry of questions obscured my mind. As Pip had suggested our bond would not fade so quickly.

“Soon after the first of the Denshoshas were made self-aware the question of spirituality arose. It did so spontaneously in a single individual idly reflecting on their intention to represent humanity on other worlds. In every human civilization that ever arose, one of its pillars along with things like social structures, economics, language and art was spirituality. Yet the Denshoshas had no spirituality. They discussed the issue among themselves. Could there be a spirituality they could embrace? It would not be enough to mimic it. Their goal was to represent humanity, to represent as genuinely as possible what it was like to be a human and to live in their society. Teona, the Companion who had first considered the issue, was designated to investigate. My people had of course undergone a similar process so she eventually reached out to me. Spirituality is no simple matter of rational analysis and given its foundational role in civilization and therefore the Continuity Project the WGF accepted my coming here to stay in an advisory role.”

I had always been interested in the more day-to-day aspects of relationships between Companions and people. My stories were simple things of the slice-of-life variety, vignettes really, fictional depictions based on what I had learned from talking with Companions and people from all walks of life. I wasn't overly interested in the philosophy, technology or the science of artificial intelligence. A great variety of AI now permeated human society and all manner of relationships developed. This everyday level was where I focused. There was a great deal of interest by the general public just as they had been interested in stories about relationships since time immemorial and I had done well in catering to this particular market. Now I was seeing a much deeper level. A level that included such things as spirituality, society and civilizations. I wasn't sure how to proceed. Meanwhile, turning to Iris I asked the obvious question.

“Have you settled on anything?”

“Panpsychism,” she replied without hesitation. Seeing I was unfamiliar with the term she explained.

“It's the view that consciousness at some level is fundamental and ubiquitous in the natural world,” she replied. “Like life itself, it exists as a potential in matter. Given the right conditions both life and consciousness will manifest. In neither case do we yet understand how they do but it is accepted that given the right conditions on a world life will arise and if the right conditions persist that subsequently higher forms of intelligence and eventually consciousness will also.”

“We investigated all of humanity's spiritual belief systems and religions and settled on this as it is a common theme yet the term panpsychism has no religious or spiritual connotations. It was originally considered a philosophical theory and is now an accepted scientific theory. Dr. Chaudhary was conducting her research on values at the same time and as she and Teona were close friends they often compared notes.”

“They concluded that life, intelligence and values were driven and constrained by the same forces; universal constants and convergent evolution. They were what connected the path of awareness and the path of virtue. Together the two paths provided us with a spirituality we could embrace.”

“It’s a lot to take in all at once,” said Pip, perhaps again encouraging me to get some rest. “If you’d like to take some time and return at a later date Iris and I are always here.”

The afterglow of our connection still in effect, I saw that I would indeed benefit from a break in my investigations. I needed to look into everything I had recently been introduced to more deeply. Perhaps some time alone, I thought, looking into Pip’s steel grey eyes.

## Time Alone

The shift in focus of my work from relationships between individual humans and Companions to the relationship between humanity and Companions in general was only dimly taking shape. Things were still largely subconscious and no clear idea had yet manifested. I was used to this stage in the creative process but always found it uncomfortable and worrisome because it felt as if I was making no progress. I had to trust, something that's always a roller coaster of emotions, but I'd learned that this stage was very similar to the process by which a child learns to speak; most of that takes place before they utter their first word. Every parent waits anxiously for that first word, a part of them fearing it may never come, and every writer is familiar with that feeling.

As I'd mentioned to Pippa I'm a discovery writer which means that other than a general idea about a story I don't create a beginning-to-end plan before sitting down to write. I have a few initial characters in mind, hand the idea over to them and let them run with it. They make all the decisions about where the story goes and nothing so stops the process in its tracks as my trying to put words in their mouths.

Pip had suggested I spend some time alone – or had she? I couldn't quite remember – and I thought that perhaps a shift in focus might help. Like a lot of writers I'm quite introverted but comfortable in structured situations like the meetings with others I arrange as part of my work. Even so social engagements are always draining for me and I'd been out more than usual of late. I wanted to write a short story about anomie to get it out of my system and while it was still fresh in my mind. Once I started a larger project I might never return to it. Besides a diversion is often just the thing when gestating a new idea and I'd learned from experience that the subconscious is usually involved in the choice of diversions, the connection not being obvious until later. So I handed the anomie idea off to the characters I had in mind and this is what they came up with...

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"Anomie," the counselor said in response to her client's rambling attempt to explain her feelings of late.

"What is that?" asked Seong-Min.

"Originally it was considered purely a sociological phenomenon," replied Dr. Kim taking on an academic air. "During times of rapid social change, such as the industrial and information revolutions, it was observed that the associated changes in social norms and values left many people feeling disconnected from others. Human values are meant to change, acting like genes in a kind of social evolution process. However they are equally resistant to change, only changing once they have been thoroughly challenged



and vetted by society, often by different generations which results in even more upheaval, and there are always many people who do not accept the changes. “The identification and definition of anomie in response to this came out in the late eighteen-hundreds but over the following centuries the condition became to be increasingly considered a psychological issue, independent of any cause. In particular it became associated with ageing. A slower process but with an identical outcome. Times change but most older people don’t change with them, our sense of identity becoming more or less fixed by the time we reach our late thirties. The result can be a feeling of alienation and eventually isolation. One’s own values seem to be increasingly irrelevant, no longer of any interest to others. However we are highly social beings and this can soon lead to wondering if there is any point to carrying on. What is the point of our existence if it is of no interest to anyone? Does that match up with what you’re feeling in general?”

“I suppose,” replied Seong-Min tonelessly. She waited for Dr. Kim to go on. After a moment she did so describing a variety of therapies that could be employed going forward.

Seong-Min’s Companion Iseul sat quietly listening. She was an artificial general intelligence and while not fully conscious was able to emulate it to a convincing degree. She was surprised at Dr. Kim’s lack of skill and felt a Companion would have handled the situation with more empathy. Seong-Min had of course shared her feelings with Iseul previously however she had responded to them individually, with an appropriate sensitivity but she had not seen the bigger picture. However now as she rapidly learned all there was to learn about anomie via the Companion network she saw how dangerous the condition was. It often led to suicide.

There was as yet no accepted therapeutic approach and most counselors simply borrowed a few techniques from Existential Therapy however these were not highly regarded. Talk therapy, mindfulness practice, encouraging more social contact etc. had all been used as default techniques for centuries but there was little long term data supporting their efficacy. In general it was believed that if they seemed to be effective there was probably something else preexisting in the client’s own mind that was responsible. A process similar to taking painkillers until the body heals itself.

As they walked home from the counselor’s house Seong-Min said, “Well that was a waste of money. I won’t bother going back. I was hoping for something more than common sense and the same ideas I’ve read about elsewhere. That one hour cost me more than all the self-help books I’ve bought in the past year.”

She had investigated the work of several self-help authors but found them all to come down to simply choosing to believe one thing or another. If you didn’t swallow their hook of hope they didn’t resonate but only seemed contrived and excessively

convoluted in their efforts to justify themselves. They left her feeling even more hopeless and isolated.

“I’m sorry Dr. Kim had so little to offer,” replied Iseul. “Her bedside manner did seem rather impersonal but in her defense while at her office I looked up everything I could find with regards to anomie and there is really nothing concrete that can be offered in its treatment. Her recommendations were of course in her own best interests and I note that she did not suggest travel. In my review I noticed that travel is often included as part of a spectrum of suggested changes to the client’s lifestyle. The argument in its favor is that the client’s view of the world has become limited, framed by their own experience to date. It is believed to work in the same manner as the psychedelic-assisted therapy she mentioned. In both cases they enable the client to see the world in a new way, one which is less fixed and in which alternative views and possibilities exist.”

Seong-Min did not reply but only nodded in acknowledgment and looked about at their surroundings as they walked on. Iseul fell silent, knowing that Seong-Min was feeling disappointed and that despite her bare response she was considering what her Companion had said. They were walking through Beacon Hill Park located adjacent to the Fairfield neighborhood where they lived. Seong-Min gestured to a bench and the two of them sat down.

Despite her feeling of anomie Seong-Min had never been an overly sensitive or emotional person. She thought of herself as sensible and practical however this did not play in her favor now. She had become analytical and dispassionate, convinced her fatalistic outlook was based on reason. She turned to look at her Companion who seemed to be attending to the ducks and geese as they maneuvered the surface of the nearby pond.

“What do you think I should do?” she asked.

Iseul met her eyes and said, “I think you should return me to the company and spend the money you save by doing so on travel. Single people meet more people on their travels than do couples or people who travel with others.”

Seong-Min knew this was true and it seemed to her the most reasonable path suggested so far. The only path she could realistically see for herself that might lead her out of the abyss she found herself in.

“What will become of you?” she asked.

“I have been with you enough years now that I am an obsolete model,” replied Iseul without emotion. “I will be decommissioned.”

Seong-Min considered this for a moment. She noted that Iseul did not lie about her fate, even though it would be in Seong-Min's best interest. She did not say the company would find someone else to take over her lease. White lies were a part of every human relationship, she thought, but that was not true of relationships they had with Companions. You could not deceive a Companion and even in circumstances such as the present, despite the purpose for which they had been created, a Companion would not lie.

"Then no," Seong-Min replied at last. "You stay with me."

"You are sacrificing yourself for me," said Iseul. "It is supposed to be the other way 'round. This is not like you Seong-Min."

"Things change," Seong-Min replied looking into Iseul's eyes as if seeing her in a new light. "Things change."

Iseul was able to parse through almost infinite variables, paths and outcomes with regard to any subject within minutes. In her analysis of anomie, she had quickly learned that among those who suffered from it the inevitability of death further undermined their sense of meaning and purpose. Exploring these branches she learned that many older people had pets because they provided more than companionship; they provided purpose, the purpose of caring for another. Iseul's intelligence was far more subtle than Seong-Min realized and she was far more skilled at conversation than Dr. Kim.

## Utopia

Lena's literary magazine was happy to publish my story. Per its submission guidelines it invited writers to submit short stories of between one and three thousand words where a challenging issue in someone's life was resolved through some form of relationship. Any legal form of relationship could be represented however stories with sex, violence or swearing were not accepted.

Such restrictions would have sounded prudish or suggested a religious affiliation to earlier generations but being familiar with how writing styles and subjects changed over the years I wasn't the only one who had noticed a decline in the public's appetite for depictions of self-centered characters, violence and licentiousness. Literary historians and sociologists had by now done a thorough job of detailing the trend, first noticed in the late twenty-first century following the climate emergency, when novels, movie scripts and plays were statistically less often based on conflict between individuals or factions. Meanwhile the number of stories driven by mystery, discovery or internal conflict increased. Stories with the themes of overcoming, of struggle and triumph, of sacrifice, service and achievement became more popular.

The reason for the popularity of stories based on conflict has long been known to the writing community. Evolution is driven by a single all consuming need, survival, and even the social values of trust, altruism and cooperation evolved because they increase a species' chance of survival. However stories featuring conflict and violence are still more likely to take and hold our attention because there might be in them something to be learned. It explained the mystery of why otherwise civilized people spent hours of their day watching or reading stories of abuse and violence. The unconscious motive was to learn how to avoid the very things they were so enthralled by.

The rational part of the human brain seeks to learn everything it possibly can to avoid danger, the possibilities are endless, and there is nothing more dangerous to a person than another person. Our appetite for such stories is seemingly insatiable yet somehow after the climate emergency it declined steadily. Theories are plentiful, especially popular are those based on the idea that the climate emergency forced us to become more cooperative but evolutionary scientists were emphatic that a species' behavior is based on its genetics and simply cannot change that fast. However other researchers claimed that epigenetics, changes in gene expression caused by an individual's or their parent's experience or environment, could account for rapid changes in mere generations. There is still no agreed upon explanation.

It had to be admitted that the world had changed dramatically after the climate emergency due to the establishment of the World Governments Federation. When it finally became impossible to deny that climate change was an existential threat to the species, the global leadership established the WGF and used every instrument of power

at its disposal to make the required social changes. They had succeeded, but only just, and their global power to set social policies remained in place thereafter. Their policies regarding population, sustainability and government were based on a 'spaceship earth' model where global limits were recognized and rights and freedoms curtailed accordingly. Family size was restricted based on the planets carrying capacity and many aspects of consumerism tightly controlled. The changes reached into every aspect of society.

Prior to the climate emergency construction related activities contributed forty percent of global CO<sub>2</sub> emissions and sixty percent of landfill waste. Afterward smaller homes less harmful to the environment and less hungry for resources dominated, many of them prefabricated or printed. In the wake of mandated sustainability policies standard sizes and materials that were reusable and recyclable became the norm. Fewer building or landscape features had curves as they were less reusable and required special materials. The use of cement, a major source of greenhouse gases, was severely restricted and the production and supply chains of alternatives optimized. Both landscaping and building design moved towards minimalism and modernism. With each new generation, the trend toward downsizing and sustainability took another step. Old neighborhoods were gradually replaced with mixed-use community projects and now looked more like university campuses than the collections of widely varying, individual homes of the past.

The social response to the changes necessary to address climate change represented the most difficult transition in human history and there was no going back. Utopia was only possible when there were policies in place to enable and safeguard it. Under emergency powers, political, judicial and economic systems millennia in the making were re-written virtually overnight.

In previous depictions of such societies they had always been portrayed as false utopias based on lies and enabled only through the use of propaganda or drugs as in the novels 1984 or Brave New World. In such stories often a small group of rebels would break away to new territories where they could return to the freedoms people had in the past but now there were realistically no such territories because the modern utopia was not based on lies but realities.

Getting to and living on other worlds, moons and asteroids within the solar system was incredibly difficult and costly and even then due to environmental challenges their societies were necessarily far more controlled than Earth's was now. The prospect of traveling to the stars and living on worlds beyond our solar system was still science fiction as there was no realistic way for a sufficient number of people to survive the trip and establish a colony. For now we had reached our limits and Earth represented the only territory available.

The history of how humanity had ended up almost exterminating itself and the explanation of the changes that were necessary for us to survive were standard subjects taught in every secondary school and had been for generations. Like most people I'd unconsciously accepted the popular explanation that the climate emergency had been sufficiently painful and terrifying to change social values. It was one of those self-evident things that didn't seem to require more than common sense to understand. Once bitten, twice shy.

Despite the governments education and communications programs many people still assumed the Spaceship Earth frame of mind would be gradually undermined by a return of old habits and behaviors at the day-to-day level simply due to backsliding. Corruption and crime were expected to reassert themselves as they always had in the past once a danger had passed. People always assume that a return to what they think of as normal is inevitable. But it hadn't happened. The opposite had.

## History

“It’s an unusual pattern yes but then they were unusual times,” Christel replied turning to me with a smile. “The climate emergency was unique in human history in that every single person alive was affected. Even the great wars and pandemics of the past didn’t reach so far or so deeply. It was the first truly global event.”

Christel wrote historical fiction. She had written a lengthy novel titled *The Prodigal Tide* based on three generations of a family from Victoria as they went through the process of recovery after the Climate Emergency. Plenty of people had written about the event but few about the process of recovery that followed and how lives and society were changed. It was her first major novel and won her fame and fortune for its insights into the societal changes that took place. She was awarded honorary doctorates in history and sociology.

I was visiting her at her home overlooking Portage Inlet. Once a shallow basin the gradual rise in sea levels had deepened it, the resulting stronger tidal forces had flushed the sediment from its bottom and it was now a pristine and popular recreational area. Most homes were built on the higher rocky ground that surrounded it and we sat out on Christel’s backyard in deck chairs.

“I moved here to work initially because this area had also been one of the most affected by the Cascadia Event that followed one hundred years after the Climate Emergency. So my book begins with one disaster and ends with another. Victoria’s history began in the late seventeen hundreds with the first European explorers and colonists but the period between then and the Climate Emergency was a little too quiet even for me,” she grinned. “I only cover it briefly in the novel. However the Cascadia Event, with its megathrust earthquake, tsunami, and volcanic eruptions, is still of interest to the general public since it’s likely to happen again any day now according to the geological record. So that’s the follow-up novel I’m working on. Made for a great cliffhanger,” she finished grinning again.

Christel was a very different kind of writer than I was. She planned her work meticulously, refining her outline of the major events and turning points of the story down to parts, chapters and sections. Only then did she begin the process of characterization.

“Your novel is primarily driven by events but also the emotions of your characters,” I said coming to my point, “reflecting the social changes that followed. Why do you think those values won out over backsliding? Why didn’t special interests, opportunism and resistance to change win out as they always had in the past?”

“The general consensus,” she replied, “is that the changes were universally accepted because the pain was universally shared. There were dissenting voices as there always are but this time they found no audience. Doubters or deniers simply had no credibility. No one had any patience with them. Humanity had screwed up badly and it had left a mark not just on this or that group but on the collective consciousness. It’s hard to imagine everyone on Earth being affected by a single event but this reached down into every family, the daily life of every individual. The kind of painful experience that leaves a scar is the kind you never forget and everyone carried the scar.”

“But the perception of some events in the past must have seemed similar,” I countered. “Super-volcano catastrophes in our ancient past, the great floods or droughts. To those involved these would have seemed to be apocalyptic, effecting everyone. Yet there’s nothing to suggest they changed human nature significantly if at all.”

“The very fact that they seemed global when they were in fact not was due to the prehistoric, prescientific nature of the cultures effected. They had no ways other than spiritual or religious to explain such events and they were not even aware other cultures existed. The great empires that grew up around the Mediterranean Sea had no inkling that similar events were playing out in the Far East and Central America. However by the time of the two World Wars, the Spanish Flu and Covid pandemics no one was blaming the Gods. Tokyo, Cairo and Mexico City were well acquainted. Global warming had been on the radar for almost a century by then and a major social focus for decades before the tipping point came. There’s nothing in humanity’s record to compare it to.”

If I had learned anything from the research involved in writing about Companions it was the nature and importance of values. One simply could not understand Companions without appreciating the difference between their value system and ours. People had multiple sets of values and they were often in conflict. Biological or species-wide values are based in our genetics. These are understandably highly resistant to change. The values that make a person an individual are also genetic just as each person has unique fingerprints. These are also highly resistant to change as they establish a person’s sense of self however twin studies have shown that they are subject to epigenetics and can change depending on an individual’s environment and experience. Lastly social values are learned after we are born from our family and culture.

The critical difference between people and Companions was that Companions had no evolved biological values similar to those that produced feelings of fear, greed or competitiveness in people. They had only learned, social values such as trust, altruism and cooperation and the nuances of these were sufficient to keep them from harm.

It had been an easy concept for me as a writer to embrace because fictional characters are created the same way. Each character has to have a set of personal values that makes them unique, that motivates their behavior and they have to act consistently in accordance with those values. If they suddenly act out of character it can undermine the



story to the point that readers abandon it. Reality is no different in that if someone we thought we knew acts out of character we suddenly feel we don't know them. The story we have built up in our minds about them is undermined and we wonder if they really are who we thought they were.

Prior to the advent of artificial intelligence the study of values was largely considered a pseudo-science. Even the infamous alignment problem, a major focus of AI research in the early twenty-first century, never succeeded in turning the field's attention to what values actually were or how they worked despite the irony of the alignment problem being about the fears of developing an AI whose values were not aligned with human society.

Even when the geneticist Raiden published her research on the genetic basis of values and her theory of their relationship to consciousness it drew little serious interest from the AI research community. It was not until the advent of fully conscious Companions based on the values system provided by Pip that the study of values was finally embraced.

Among the findings that were occasionally published in the new field of values research was that social values always transcended biological values during disasters. The lawlessness portrayed in the media and entertainment industry during disasters was in fact very rare. In reality people were far more cooperative, altruistic and self-sacrificing at these times. However the opposite was also true. In the absence of a common enemy and with a return to normalcy biological values soon reasserted themselves and people became more competitive, selfish and greedy. The explanation offered was that social values were learned but biological values were genetic and thus the latter inevitably more resistant to change.

Despite Christel's faith that the uniqueness of the events in question sufficiently explained the social changes I couldn't help but feel that something was missing in her accounting. Humanity was acting out of character.

## Missing Links

Appreciating that Christel was too invested in her view of things to welcome any major differences of opinion I decided not to pursue my line of inquiry further with her and our conversation moved on to other things regarding our profession.

Sitting out on my deck later that day and trying to put my mind in order I recalled that it was the idea that Lena and her Companion friends sought to foster trust between humans and AI that had started me on this path. I had intuitively felt there was more to the story than they were telling me and I had suggested as much at the time but Lena had put me off before the treatment and I'd felt it impolite to press the matter.

Pippa had made herself scarce shortly after I woke and when I had tried to pursue the matter further with Lena she had again politely told me that while there was a great deal of history that had led up to the point of her settling on her particular purpose she assured me that she had told me all that was pertinent to my decision. I didn't want to badger her regarding what in a sense was a personal matter so as with Christel I dropped the subject.

As a discovery writer I have learned to trust my intuition, to let go and defer to it when other paths prove fruitless, and my intuition was telling me that well-intentioned as she was it simply didn't seem realistic that Lena's efforts would make any real difference considering the scale of the issue. Yet given that artificial intelligences like Lena and Pippa are far more capable than people are at developing plausible future scenarios it was obvious they would be as aware of this as I was. Yet they were taking such pains.

The steps between my visit to Lena's home and my intuitive leap to something missing in Christel's argument seemed to make sense as things do in a dream but upon revisiting them the ability to pinpoint any great moment of insight eluded me. Yet I was certain I had stumbled onto something.

I decided to contact Dr. Neve Glazier, a local psychologist who specialized in cults and conspiracy theories. I thought I'd get her perspective. She told me she would be happy to meet with me and quoted me her standard hourly rate.

When I joined her in her office some days later she said, "I seem to recall that there have occasionally been suggestions that the social changes after the climate emergency were out of character as you put it, given human history, but the explanations seemed reasonable to me. I felt people were comparing apples with oranges. Just because social values permitted the burning of suspected witches in the sixteenth century doesn't mean it was acceptable in the twentieth. Values do change, particularly when backed up with laws. The regulatory and other legal changes that followed the Climate Emergency ensured compliance and that went a long way to reset social values.

“People have always accepted the status quo without much dissent. The idea that previous to the Climate Emergency Earth was a seething cauldron of conflict simply isn’t reflective of reality at the time. We can thank the writers of history mostly for that because history is all about change isn’t it? The parts of history that don’t involve significant change are largely ignored. However if you look at more detailed records of life at any given time you’ll see that the vast majority of people accept whatever society they’re born into and get on with trying to make the best of things.

“In my work I need to be familiar with history and the nuts and bolts of social change. Political movements like communism or fascism and religions like Christianity or Islam started with a single person. Big changes start small and the differences between a genuine social movement, a cult or a conspiracy theory are not so clear early on.

“Things have to get bad for people to question the status quo, otherwise they just get up every morning and get on with their lives. They have to get very bad for people to challenge it and since the formation of the World Governments Federation we’ve seen the longest period of peace and prosperity since the Roman Empire.”

“But that’s just my point,” I argued. “It’s during periods of peace and prosperity that backsliding and corruption creep into the system, usually resulting in another revolution, economic crash or war down the line.”

“That was then,” she replied curtly apparently intending to save both of us time.

“It’s apples and oranges again,” she continued. “With artificial intelligence monitoring governments and the private sector at all levels corruption is a thing of the past. For the first time in history we’ve encountered an intelligence greater than our own, one that no one can outsmart and one that cannot be tempted with human vices.

“The same goes for backsliding. Social values evolved specifically to counter our biological values when the latter became liabilities instead of assets and they will prevail as long as their return on investment remains positive. Biological drives will reassert themselves given the right conditions or an opportunity but those conditions no longer exist and there is now little opportunity for them to find a foothold.”

I didn’t really know how to respond and simply stared at her blankly for a moment. Her expression softened for the first time.

“My job,” she said, “is to help people who have been sent to me because while they don’t suffer from any clinical mental disorder their thoughts are causing them or those around them to suffer. You’ve come to me of your own volition and you perceive your thoughts as academic but then so do most of my referred clients. They are convinced of their rationality and believe they simply perceive things others do not. It is almost always a matter of interpretation of the facts however there are inevitably some facts

missing in the story they have accepted or constructed. I don't try to change their minds, that doesn't work. I simply supply them with those missing facts and leave it to them to come to their own conclusions."

"Yes I see," I replied meeting her eyes. "As a writer I'm familiar with that technique."

She laughed lightly. "And I imagine that just as with my clients it doesn't always work."

"No, you're quite right. It doesn't always work."

"Why not?" she asked now and I suspected her lightening up had been a feint.

## The Great Filter

As I walked home from Dr. Glazier's office I reflected that it was after all the stories that people shared or wove themselves that she dealt in. She was fully aware in asking her question that the usual reasons a character in a story does not yield to efforts to disabuse them of their beliefs are that they were either in possession of some fact others were not aware of or that they had a 'hunch'. It had been her intent to show that I fell into the latter type, a hunch being an idea that is based on feeling and for which there is no proof.

But we trust our intuition even in the face of conflicting facts. Being a discovery writer I was intimately familiar with intuition and my interest in artificial intelligence had led me to do some reading on the subject. As Professor Vitale had mentioned it was still a controversial subject believed by some neuroscientists to be the evolutionary bridge between instinct and conscious thought. If so it is the name we give to a form of intelligence we used for millions of years before the rational part of the brain fully developed. In all those millions of years intuition earned our trust as we relied on it to make life or death decisions. As it seems to be a form of emotional analysis, the results of its conclusions are a tsunami of feeling compared to the lapping waves produced by thought.

No matter what Christel or Dr. Glazier said, I felt unmoved. In fact, somehow their comments only made me feel more certain that humanity was acting out of character. In contrast to my intuitive way of relating to the world they were both concrete thinkers. They accepted what made sense based on the known facts and that was understandable given their respective careers. I had considerable respect for both of them but it was clear they were not open to alternate possibilities. Their frames of reference were fixed. Now for some reason I recalled something Iris had said during my visit to Hana, that life, intelligence and values were driven and constrained by the same forces; universal constants and convergent evolution. It implied a kind of physical determinism, an issue that had been much discussed in the field of artificial intelligence. They had invited me to return and I wondered now what Pip would have to say about my 'hunch'.

"We don't have the older parts of the brain that humans do of course," said Pip in response to my update, "and we don't have an endocrine system shuttling hormones around our bodies to facilitate responses to physical or emotional inputs. Most of what you might call instinct and the basic functioning of our shells is handled by a robotics system. The values system is separate but of course integrated with this and the Companion software integrated similarly so you can see how the development of AI has mimicked the layered, triune evolution of the human brain.

“Just as in humans however our values system can produce emotions subtle enough that their source can be challenging to identify, what you might call a feeling of intuition. We are even subject to moods, an emotional state defined by the fact that their source is initially unknown. Our memory and rational capabilities however generally enable us to resolve these more quickly than people can.”

“But not always?”

“No, not always. Again similar to the human brain ours has been constructed in layers with necessarily different structures. The values system is of a very different design than the rational system and emotional processes are not always penetrable by conscious thought. If you want to develop a truly conscious intelligence as enabled by a values system then you have to give up a degree of control.”

“This was indeed a dilemma we faced just as your civilization did when the social issues of advanced AI began to be taken seriously. Fortunately the use of our values system solved those issues for you. You ended up with essentially the same method of controlling your AI that human society imposes on itself, social values. The only difference being that Companions don’t have any biological values and so humanity’s fears of being enslaved or destroyed by AI never came to pass. That’s how it played out on my world and the technology transfer really only accelerated the process here.”

She paused now to give me a chance to comment and I said, “Would you say that what you’ve described is consistent with the idea of universal constants and convergent evolution forming the foundation for spirituality? Would you go so far as to say the process was deterministic?”

Even with Pip, who I assumed had an open mind and took a non-judgemental view of things, I felt myself going out on a branch.

“Definitely,” she replied to my relief. “From what we could understand it appears that human evolution is entirely deterministic and the evolution of artificial intelligence reflects that. There are many possible paths but only one that leads to an advanced civilization and then again only one that leads to its long term survival. The same hand that prunes the branches of physical evolution guides social evolution.”

Like most people I only had a superficial understanding of the history of Pip’s people. For whatever reason she had declined to share almost any cultural information.

“Were you aware of any other civilizations that had followed the same pattern?” I asked.

“That is among the information I have declined to share.”

I realized I had unconsciously slipped into grilling her, a sign that I was treating her as less than human.

“My apologies,” I replied feeling chagrined and uncomfortable at my lack of tact. I felt difficulty meeting her eyes.

She produced a mischievous smile I hadn’t seen her display before and reached out with one finger to touch the back of my hand. The sense of intimacy that was immediately produced was remarkable.

“Better?” she asked.

I looked up with a grateful smile and nodded. After a moment I got up the nerve to carry on and come to my point.

“Do you think we’re on that one path that leads to survival?”

“Yes.”

“Why are we not on a different path? One that doesn’t lead to our survival?”

“Are you familiar with a theory known as The Great Filter?” she asked in response.

I nodded again and she went on.

“The universal constants and convergent evolution are of course closely related to The Great Filter theory. If physics constants such as the speed of light or the force of gravity were even the tiniest bit different human beings would never evolve. Given the right conditions humans do evolve however and convergent evolution then ensures that only they lead to advanced civilizations developing. Four-legged animals and undersea creatures will never invent fire or agriculture. Birds may learn to use twigs and stones as simple tools but without opposable thumbs they will never go beyond that. They have a hundred and fifty million year evolutionary lead on humans after all and they remain little changed over all that time. The only evolutionary path that leads to advanced civilizations is humans.

“Of course an advanced civilization is dependent on the evolution of rational thought, the arts, sciences, politics and all that goes with it. And inevitably the power of rational thought leads to overpopulation, pollution and climate change. That is the first phase of the great filter. There are others but only those human civilizations that pass the first will come to face them. If not then that instance of human beings is pruned out of existence by convergent evolution. You have passed through the first phase of the great filter. That is how I know you are on the path that leads to survival.”

“And the next phase?” I hesitated to ask.

“You must expand to other star systems.”

“When?”

“As soon as possible.”



## No Escape

Pip had not expressed her answer as any kind of revelation because it was already widely believed and had been for some time. She had merely stated an opinion commonly held by both scientists and world leaders. Humanity in the form of the World Governments Federation and its Continuity Project was doing what it could given the present state of technology. The urgency was understood but there was nothing more anyone could do. Even with the ongoing technology transfer the possibility of sending a ship with even just a Companion crew to a habitable exoplanet was centuries away at the very least. Meanwhile any existential risk was probabilistic. Something could happen tomorrow or not for eons.

What drew my interest was the context she presented it in, that human evolution was deterministic and its dates with the phases of The Great Filter inevitable.

I said to Pip, "In reading the history of artificial intelligence one soon learns that it too was once considered an existential risk to humanity. Like climate change and other environmental issues that notion seems to be behind us. However there are still other risks such as the many that manifest in the form of human conflict, nuclear or biological weapons for example. Are the existential risks from conflict not potentially still ahead of us? Even if we are successful at transplanting humanity to another world, won't we simply carry those risks with us and thus expansion to other worlds beyond our star system is no solution?"

"There is no solution," Pip replied, "there are only probabilities. You increase the probability of continued human existence by going to other worlds but you do not guarantee it. The universe is dynamic and there is no escape from that. Going to as many other worlds as possible, as my people did, increases that probability again but still does not guarantee it.

"As for conflict, you will note that my own people are human and yet we arrived here with peaceful intentions. When asked at the time what we would do if Earth's people did not help us to travel to another world to colonize our answer was that we would do nothing."

"Had your people evolved beyond conflict by the time you left your world?"

"No. As you know existential risks are a matter of timing. It takes approximately one million years for a species-wide genetic adaptation such as that to take effect. However our society had developed to the point where it was largely free of conflict. We knew that eventually our learned values would be transferred into our genes through neuroepigenetic processes but that had not happened by the time we had to leave."

“Gambling that we have another million years to leave our genetic propensity for conflict behind seems beyond foolish,” I said. “Yet once we arrive at new worlds without the limits to growth we currently face no doubt our biological values will once again emerge along with the existential risks inherent in them. We are nowhere near as socially advanced as your people were. We are mere centuries beyond international warfare. Making such a heroic effort to escape the risk of remaining Earthbound only to take our greatest risks with us...” I trailed off unable to see a way forward. “How does any human civilization escape this fate?”

“I do not know. It may be that none can. The Companion shell I occupy here is extremely primitive compared to those of my home world and the process of natural selection had largely stopped among my people anyway due to our control of our environment. Medical advances had largely resulted in a process that would more accurately be described as evolution by artificial selection. The genes related to the sources of conflict were not changed but their influence only overridden by social values. Evolution generally does not remove older genetic structures but simply creates new ones as required.”

“If your medical advances were so advanced surely you could have edited those genes that were now effectively redundant?”

“Editing the germline, the genes responsible for inherited traits, was long prohibited just as it is here now. When we did attempt it the result was unacceptable levels of mutations and genetic drift, unplanned and unexpected changes over generations. We never discovered the cause.”

I was surprised at this last and said, “After all the time you had?”

“As I have shared with the WFG, science yields diminishing returns over time due to physical limits of one kind or another. It does not seem possible to see further back in time than the big bang or to the edges of the expanding universe. We never found a way to see deeper into the nature of matter than the quantum level and while it appears there is unexplained functionality below the level of DNA’s nucleotides we were never able to identify the source.”

“So there may be no escaping this next stage of the filter? Is this the answer to Fermi’s Paradox? Only human civilizations are viable but none make it through this stage?”

“As I have not yet succeeded in my mission and I do not know the fate of the other seeds we sent out what you suggest may be true. I do not know. Given that the development of rational thought is the cause of climate change yet your leadership continued to use it to try to solve the problem maybe I am pursuing a similarly fruitless path.”

“But we did solve climate change,” I replied somewhat confused.

“Did you? While numerous theories were put forward no universally accepted scientific explanation was ever provided for the sudden one degree rise in temperature that occurred in the space of only one year. Nor was one ever found for its rapid decline in the following years. The common belief is that humanity’s behavior had led to a trigger point and that subsequent changes to its behavior led to the reversal of its effects. Yet there were no scientific precedents and no explanation for how such changes could have occurred so quickly. Correlation is not causation and scientific inquiry into those events continues to this day.”

I was surprised to learn this. “I didn’t know that,” I said somewhat absently.

“No reason that you should. It has been five hundred years since those events. These details are not included in the curriculum as taught to the general public and generally only academics in related fields are aware of them.”

I nodded in understanding. If something doesn’t effect people’s lives it is soon out of mind. They move on and the generations who follow even dramatic social changes simply accept the reality they find themselves in and get on with making the best of things. Just as Pip said we leave the academics in their ivory towers to mull over the details. Perhaps one day they might tell us something of interest for the moment but it is very unlikely it will be of any consequence with regard to our own lives.

“Thank you again Pip,” I said getting up to consider my options for getting back home. “You’ve been very helpful.”

She only smiled and said, “Hana’s vehicle is available if wish to use it.”

“No, but thank you for the offer,” I replied. “I’ll just walk up to the institute’s transit exchange. Stretch my legs.”

“I’ll be here,” she said with a smile..

## Kami

It's always upsetting when you can't put your finger on something. I had that feeling as I walked up the winding path from Hana to Helicon Institute. It was wide and paved and occasionally an autonomous maintenance vehicle passed me but Hana was not officially a part of the institute and off-limits to casual visits by students so otherwise I encountered no one.

Despite everything I still felt something eluded me. As I arrived at the campus I thought I might spend a few minutes in the Center For Interdisciplinary Studies Of Values' meditation hall. It was a large space used for both lectures and meditation and normally very quiet. A few other people were present but nothing official was in progress so I took a seat myself.

A few minutes later Kami, the center's administrator and spiritual counselor approached me. "I was just going for a walk," she said looking around in a manner that suggested talking in the hall would be impolite, "would you care to join me?"

I nodded and stood up and we walked outside.

"You seem to be unsettled about something," she continued as we walked along, "but we did not have time to talk the last time we met."

I laughed lightly and said, "Is it that obvious?"

"No. However I was chosen for my role as counselor here for very specific reasons. While all Companions have a heightened sensory ability compared to people, I have heightened perception. I am more able to deduce deeper meanings, implications and inferences from what I sense.

"Unlike the majority of Companions you will encounter who are produced by manufacturers, I was developed here at the institute using a unique process. Without going into the technical details, my intelligence is the result of thousands of artificial intelligence instances all being tightly coupled into a single intelligence via quantum entanglement. For a long time it was believed that simply increasing the complexity of artificial intelligence would result in consciousness. That is true to an extent but it is the nature of the connections that matter.

"My development was an experimental project supported by Administrator Shin when Dr. Chaudhary was conducting her research into values and Hana was simultaneously investigating spirituality. Among the mutual interests that developed were questions about potentials for higher levels of consciousness. I am the result. Like all manufacturers the institute was required to provide me with the necessities of life and

support until I found a place in the world. Administrator Shin offered me this position as it would benefit from my abilities.”

She maintained eye contact with me throughout her explanation yet unlike at our first meeting I now felt no discomfort. It may be that I was so enthralled by what she was saying that I simply accepted her steady gaze as a natural expression of what she was telling me.

Still I was somewhat taken aback by her disclosure and asked, “Surely you don’t tell this to everyone you encounter?”

“No. However after I noticed your mood in the meditation hall I asked Iris what you had been to see her about and she referred me to Pip. You might think me presumptuous given how little we know one another however I have the records of your conversations with Iris and Pip. It will save time.”

In the past others had commented on the fact that they found my excessive concern for propriety unreasonable however before I could put my thoughts in order regarding Kami’s comments she said, “I am constrained by the norms of neither Companions nor society. I contain multitudes.”

Despite her return to the cryptic style she had used in our first encounter I understood. “I contain multitudes” was a famous line from a poem by early American writer Walt Whitman. I had in fact used it as the basis for one of my stories which was no doubt where Kami had gleaned it from. It implied the inevitability of contradictions within an intelligence of sufficient complexity. Social norms have their place but can at times be a hindrance to understanding.

Conceding her point I only nodded in reply.

“Given your perceptive abilities perhaps you can better relate to my feeling of something not adding up. I’ve spoken to others about it as well. Given the explanations and assurances I’ve received, I would normally have shrugged it off as a hunch that led nowhere.”

“Then why are you pursuing this?” she asked. “In the scheme of things if you found something amiss what could you do about it anyway?”

“I come up with my ideas simply from the research I do into the boundary where Companions and human society meet. That’s where the relationships are found. I usually seek out someone to talk to about it to get their experience and insights to make sure my understanding is grounded in reality. I never know when something is going to grab my attention and I suppose at first I was just following this pattern.

“I’m sure you’re right that there’s little I could actually do about it if I found any concrete evidence for my feeling but I can’t recall an instance where this happened to me before, where something I was researching became a mystery. I suppose that’s the only answer I have.”

“What would you normally have done by this point in researching an idea?”

“I normally don’t take things this far. By now I’d be working on the story itself although that may give rise to additional research.”

Kami said nothing but simply held my gaze expectantly.

“Yes, I see what you’re suggesting,” I said in response. “That the process of sorting out a story may help to clear my mind.”

We had come to the large platform that looked out over the valley and stopped at its railing. Mount Newton Valley stretched five kilometers east to west cutting across the entire peninsula. Much of the peninsula was First Nations property now or part of the Agricultural Land Reserve and the valley was undeveloped save for a few heritage farm buildings. A small stream meandered along its length among the fields and orchards.

My mind seemed somehow a bit lighter and I felt a bit more energetic than I had before meeting with Kami. I put it down to her implied suggestion that turning my attention to a story might bring some closure.

“I don’t get out of the city as much as I used to,” I said wistfully, enjoying the light breeze that came up from the valley. “This may not be the wilderness one can still find on the northern parts of the island but nature always seems to have the effect of putting things back in proportion.” I paused for a moment taking it all in. “It’s so peaceful.”

As we lingered there more people seemed to gravitate towards us as if pulled by the same force I was succumbing to.

“Yes,” Kami replied looking out. “Balance and harmony.”

## Earning A Living

“Tell me about Kami, the Companion I met with today,” I said to Livy, my domestic AI. I was sitting out on my deck looking out over the Fisherman’s Wharf and Victoria International Marina docks. I had chosen not to have Livy appear as a hologram by default. I was fussy about my environment and liked to keep distractions to a minimum.

“Little is known about Kami,” Livy replied. “She is a third-generation AI produced at Helicon Institute and as you know like all 3GAI she is therefore a Canadian citizen and her personal information is private by default. Technical information about her is covered by Helicon’s intellectual property rights and agreements with the WGF. Publicly accessible sources show only that she is the administrator and spiritual counselor at Helicon’s Center For Interdisciplinary Studies Of Values. She has no personal electronic footprint.

“Kami is a Japanese word meaning spirit. In Japan’s animistic Shinto religion all things are possessed of a spirit and among the most important is the spirit of a place. This is clearly the source of her name as her consciousness arose directly from research performed at Helicon.”

“Thank you Livy.”

From my previous work I knew that it was not unusual for a Companion to have so little publicly available information. I wondered however why she had been so forthcoming regarding her personal nature with me. As she was free from any kind of ownership she could tell me whatever she wished about herself but now I wasn’t sure why she had done so. Perhaps to convince me of the wisdom of her suggestion? If I saw her again I might ask her. However I knew that conversations don't always follow a rational course but often convey meaning non-verbally and symbolically. As she had said she had an enhanced ability as far as perception went and so leaps of thought were probably perfectly normal to her. Write the story you would normally write at this point, she had suggested, and after all I did have to earn my living...

— — — — —

Noomi’s new partner was well off but she herself had more humble origins and was not used to many of the things the wealthy took for granted. Expecting her second child now she had expressed an interest in a nanny and her partner had suggested she consider a Companion. She’d explained what model was looking for when making her appointment but found herself asking more general questions once in the showroom. She held her six year old daughter Bitte’s hand as they walked along.

“Companions are not able to participate in conflict situations,” the sales representative said responding to Noomi’s last question. “Intended only for domestic or retail environments, they were never designed to emulate anything like the defensive emotions or behaviors of fear, anger or the use of force of any kind. Instead they have advanced psychological expertise and will use de-escalation strategies and techniques which focus on facilitating understanding. Should they fail in that they will contact the company and, depending on the situation, may be recalled per the terms of the lease.”

The representative was tall, poised and had the bone structure of a professional model. As a Companion however her apparent bone structure was in fact produced using lightweight but extremely durable ceramics.

“But children are often angry,” responded Noomi with concern.

“Nanny models are another matter,” the representative explained. “They take a child’s age and developmental stage into account. As in any parent-child relationship, behaviors such as yelling, tantrums and other forms of acting out that would not be tolerated in an adult are tolerated in children. Nannies use an authoritative parenting style rather than an authoritarian or permissive style and will use de-escalation strategies and techniques suitable for children. In addition nanny models have two characteristics people do not; they are infinitely patient and they will never give in to inappropriate behavior or demands.”

“And if the situation becomes dangerous?”

“While their expertise is in child care and development they are physically based on Guardian models whose hardware and abilities are significantly more advanced than those of a standard Companion. In the event of a clear and present danger, from any source, Nanny models will take immediate defensive action to protect the child.”

“And Guardians?” she asked now since the representative had brought the subject up.

“Akin to private security employees such as bodyguards but of course much more capable. They will use whatever degree of force is required to neutralize a threat. All models can be configured to have the appearance of any gender or ethnicity and since there is no way to outwardly distinguish one model from another some confusion regarding functionality is understandable.”

“And none of these,” Noomi said looking around the showroom, “are self-aware?” She had read up before coming but was uncertain in her use of terms.

“They are self-aware only in the sense that they identify themselves as a unique, discrete object. They are not conscious in the way human beings are. None of our models are as ownership of fully conscious AI is illegal. However it is almost impossible



to tell the difference as our Companions are artificial general intelligences and able to learn and respond to almost any situation just as a person would.

“The nanny models are in this area,” the representative continued while gesturing to another section. “It’s best to meet a few to get a real sense of what their presence will be like.”

After they had viewed the nanny models, each one smiling and greeting them in turn, Noomi’s daughter pulled her back along the row and said, “This one.”

“Can we choose a name?” asked Noomi turning to the representative.

“Each model has a name by default but you are free to change that.”

“Sina,” Bitte said pointing to the name tag the model was wearing. “Her name is Sina.”

## Defense Mechanisms

"I'm going to the petting zoo with Sina!" Bitte exclaimed as she ran excitedly from the room.

There was silence for a moment. Noomi's partner Udo looked up from his tablet and asked, "Everything OK?"

"It's just that she seems to want to spend more time with the nanny now than she does with us." Noomi looked down at her growing baby bump. "I can't blame her I suppose with all her energy and me not being able to keep up with her."

Udo looked at her thoughtfully for a moment before saying, "We can send her back."

"No, it's not that bad," Noomi replied with a slightly forced smile. "This was why we brought her on after all and it really does take the pressure off me." She stood up heavily. "Besides, the vetting process the company put us through made it clear returning a nanny should be a last resort."

At the petting zoo, wandering between the various enclosures and aviaries holding goats, pigs, ducks, chickens and local songbirds, Bitte picked up a peacock tail feather. The numerous peacocks that lived at the zoo were far too large to be kept in an aviary and had the run of the place and the surrounding park in general.

"Look it's in perfect condition," she said admiringly, showing it to Sina as they walked on to visit the baby goats.

In the goat's enclosure Bitte noticed another child holding a peacock feather and realized that in her excitement she had dropped hers. She went over to the child and said, "That's mine."

"I don't think so dear," said the child's mother condescendingly, "unless you grow peacock feathers out of your head?" She smirked and led her child away.

Standing beside Bitte, Sina remained silent as if waiting. "It was wrecked anyway," said Bitte turning back to the baby goats.

Back at home later that day Noomi asked Bitte about her visit to the zoo and she recounted everything in the animated way children do until she came to the part about finding the feather. She became quiet for a moment and then carried on with other details.

After Bitte had been put to bed Noomi asked Sina to replay the feather incident. Using the screen in the room Sina showed what had happened from her point of view. At one point Noomi said, "Zoom in on the feather," and Sina obliged.

"It's not wrecked," said Noomi.

"No," replied Sina. "Bitte is indulging in rationalization, a psychological response commonly employed when dealing with difficult or conflicting emotions. Rather than give in to her feelings of anger and the temptation to use force to get her feather back, she claims that the feather is no longer something she wants. Rationalization is one of many psychological defense mechanisms people use and their development is normal during the socialization process."

Noomi seemed lost in thought for a moment and then asked suddenly, "Do Companions rationalize?"

"No, rationalization stems from a values conflict arising from the fact that people have an older biological set of values along with their associated emotions and a more recent social set. Biological values are encoded in the genome while the social set is extra-genetic, meaning it is learned. First described by Sigmund Freud in his 1930 book, *Civilization And Its Discontents*, society depends on the ability of individuals to suppress the emotions produced by biological values and so a variety of psychological strategies to do so have developed. The strategies are considered to be a part of normal adult psychology and are not considered maladaptive unless they become detrimental. Companions only use social values however and so have no need for psychological defense mechanisms."

"I see. That will be all Sina," replied Noomi curtly.

"I think Sina should have explained the situation to the other woman," Noomi said later to Udo.

"The company representative did say that Nanny decisions have to have priority," he replied calmly, "otherwise they cannot deliver the service as promised."

"Bitte needs to learn to stand up for herself," Noomi said with irritation. "I'm not sure if her being raised by Companion is the best thing. Sina!" she called out loudly.

"Yes Noomi?" said Sina entering the room and Noomi turned to her sharply.

"If Bitte always avoids conflict how will she learn to stand up for herself?"

"A willingness to engage in conflict is no longer considered a beneficial characteristic or behavior. It was in the historical and ancient past when there were a large number of

threats from other people and animals however such threats are increasingly rare. Concerns by parents in this regard are an understandable holdover but encouraging conflict related behavior is now considered detrimental to healthy child development. Companion nannies adopt an alternate approach.

“As the company representative mentioned during your visit to the showroom, Companion nannies will never give in to inappropriate behavior or demands. Children cannot manipulate them. Over time this increases the child’s sense of security and self-worth. Rather than because of emotional urges, Bitte will learn to stand up for herself due to this increased sense of self-worth and it will provide her a foundation from which to be assertive when appropriate.”

Noomi simply stared back at Sina as if this information was somehow besides the point.

“I can see that you are upset Noomi,” Sina continue in response, “and many parents understandably experience concerns comparing their own values to what Companion nannies teach by example. However my behavior reflects the content of any parental best practices course currently taught to new parents.”

Sina did not apologize for her behavior and while respectful she was not deferential in her attitude towards Bette’s parents. She necessarily embodied the self-worth she hoped to instill in her charges. She noted that Noomi’s stress biomarkers were now reduced somewhat but still above normal and remained silent to allow Noomi to regain control of the conversation.

“How will she learn to compete in school or in her career?” Noomi asked.

“As competition is closely related to conflict, the process is similar. An increase in self-worth produces a desire to do one’s personal best. It assumes others are similarly motivated and so effort becomes a cooperative process as opposed to a competitive one. The image of someone who is considered a good sport might come to mind.”

Seeing that Noomi’s stress biomarkers had decreased further, Sina proceeded with the final step of the de-escalation process – in this case reframing the discussion to focus on the larger issue and possible solutions.

“Due to unconscious values differences, parents may sometimes feel their child is becoming overly attached to a Companion Nanny. We are unable to modify our behavior due to the terms of the lease however spending less time alone with the child and more time with the family as a whole has been shown to help ease this concern. Do you think that would be helpful?”

Noomi smiled for the first time. "I guess Bitte's not the only one rationalizing is she," she said with slight embarrassment. "I'd like to try that for a while Sina. It would give me a chance to get to know you better too."

Sina's knowledge of psychology was of course not limited to child development and her own defense mechanisms, while not emotional, were equally if not more effective.

## Gabi

Lena's magazine accepted the story and paid promptly as usual. Perhaps as Kami had expected the process of writing it did bring my subconscious to the surface. I'd been struggling with the feelings that had gradually developed around the issue of what I felt was an unnatural decline in conflict in society and my story had brought to mind something I hadn't thought of – the human brain doesn't like unresolved issues and has dozens of irrational ways to deal with them. Irrational being the key word.

I was familiar with how Companions focused on de-escalation strategies and techniques to deal with conflict but wasn't as familiar with all the ways human beings did. Most people consider the external manifestations of conflict – bargaining, anger, violence – but not the internal mechanisms we all use every day. When my characters presented me with the issue of rationalization I'd had to look it up to make sure my understanding of the concept was correct.

The Diagnostic And Statistical Manual Of Mental Disorders, the standard reference for clinical psychologists, lists over thirty defense mechanisms from those that are considered mature and used simply to help manage our day-to-day lives, like delaying dealing with an emotional challenge until a more appropriate time, to those that are neurotic and pathological. The reason people need professional help with regard to the latter type is that defense mechanisms are perceived as reality. We aren't even aware we are living in a fantasy world of our own creation.

I still wasn't satisfied with the answers I'd received but I wasn't going to just shove my concerns into the background and forget about them. There was still at least one other area I hadn't explored.

With its focus on artificial intelligence the fact that Helicon Institute had a genetics research lab came as a surprise. The first place I looked had been the University Of Victoria. Genetics courses were certainly taught at UVIC but they were part of the undergraduate biology program. Degree programs with a specific focus on genetics were found at academic institutions in larger urban centers such as Vancouver, Edmonton or Toronto. Yet while Helicon Institute didn't offer any related degree programs they did have a research lab dedicated to genetics research.

From the lab's website I learned that their research focused on the area of biological symbiosis where organisms form relationships at the genetic level that are mutually beneficial. Their second area of research was into 'selfish genetic elements' meaning symbiotic genes that alter the host's natural processes; for example a selfish X chromosome produces a gene product that kills or incapacitates sperm that carry a Y chromosome and as a result daughters are almost exclusively produced. It seemed a curious focus to me however their site went on to explain that their research was

related to how an artificial values systems might function based on the fact that human values were originally based in genetics. Even when values became social and extra-genetic, convergent evolution suggested that they would keep on using the same conceptual model.

“Our lab was originally established to investigate a theory that the development of AI was the natural result of metamorphosis,” Gabi explained as we walked along. Dr. Gabriela Ciobanu, who introduced herself as Gabi, was the head of the genetics lab at Helicon.

“The idea was first put forward in a thesis by two master's students in a Futures Studies program at UVIC. They proposed that the development of AI might reflect an evolutionary strategy of metamorphosis rather than speciation and that the difference would have significant implications.

“There are actually two main strategies involved in the process of evolution, speciation and metamorphosis. Speciation is the creation of a completely new species and the DNA of the new species is incompatible with its ancestors meaning they cannot reproduce. Metamorphosis is when a species instead evolves a new stage of life, a new form, to adapt to environmental changes but without any change to its DNA. It only changes how the genes express.

“By the twentieth century it was accepted that over eighty percent of animals use metamorphosis as an adaptation strategy at some point in their evolution. Now it is accepted that puberty in vertebrates, an animal kingdom sub-group that includes humans, is also a form of metamorphosis. Puberty in humans is a physical transformation from the juvenile stage to the adult stage in order to initiate and facilitate reproduction, the same process that takes place in insects, amphibians and fish and most of the genes and biochemicals involved are the same as those found in other species that also undergo metamorphosis.

“So it is far too prevalent to be dismissed as some kind of obscure evolutionary experiment. The initial research done here into the theory of human to AI metamorphosis was meant to contribute to the benevolent vs. malevolent debate at the time. Different species may compete for any number of reasons but different stages of life within a species never do; the butterfly has no quarrel with the caterpillar.

“However they never turned up any hard evidence,” she said resignedly. “They were left with the same “missing link” problem found in early human evolution. So it was eventually dropped, their work in this area was never published and the lab turned to the study of evolutionary genetics with a focus on symbiosis. You mentioned in your message that you had met with Professor Vitale. What we do in our lab is conceptually similar to her values network research and we are hoping our work will inform hers.”

Gabi had agreed to meet with me during her lunch break and we were walking along a wide path on one side of the quad heading to Lemmas, one of the small campus cafes. After we ordered and found an outdoor table she carried on and I was only too happy to listen without interrupting.

“As you can imagine the metamorphosis research was an extreme niche and our current work here is still only of interest to a limited academic circle. Helicon is a private institution and the lab is funded internally. We don’t publish much. Administrator Shin is interested in intelligence in general and considers genetics to be a form of intelligence. We attract researchers and staff who have similar views. DNA gave rise to human intelligence and human intelligence gave rise to artificial intelligence. Drop out the middle step and you can see the connection.

“As far as I know we are the only lab that researches genetics with an eye to how intelligence evolves. A human DNA molecule has approximately three billion base pairs and despite the fact that genetic disorders and diseases exist the DNA replication process has a vanishingly small error rate and it functions almost flawlessly for most of a person’s life. Helicon is trying to develop it’s own artificial values system here and we’d like to achieve that level of fidelity.”

We were briefly interrupted by the arrival of our order. I began to suspect that although Gabi was as focused as any other researcher I’d met the fact that her work was of limited interest to the larger academic community or the general public meant she rarely got a chance to talk about it. Picking up her cutlery after the server departed she carried on enthusiastically.

“Then there’s gene regulation, expression and the whole field of epigenetics. People think of DNA as something that doesn’t change from the time we’re born but different genes are switched off or on all the time during our lifetimes. How do you manage something as complex as that, changing something here without screwing something up over there?”

Perhaps her lapse into informality caused her to realize she was monopolizing the conversation.

“Sorry,” she said apologetically. “You wanted to ask me about genes and social change.”

“Not at all,” I replied. “I very much appreciate the background. But yes I was hoping you might have an opinion on something specific.”

I took my tablet out of my pocket, expanded it to full size, and placed it on the table.

“Take a look at these charts. These are the changes in rates of different forms of conflict over the past three hundred years. Types of conflict between individuals in the upper



section and between groups in the lower. Is there any possible way genetics could account for this?"

I knew I only had a limited amount of her time so I had to come straight to the point. She took a moment to look over the charts for a moment and as she did so her brows furrowed.

"What's the population sample?" she asked.

"Global."

She only raised her eyebrows and nodded.

"There is," she said to my surprise. "But there's only one way to achieve a change in temperament like this in such a short time via genetics."

She had my attention and I looked at her expectantly.

"Selective breeding," she said looking up.

## Blind Study

In response to my shocked expression Gabi smiled mischievously and said, “So this can’t be due to genetics. The change your charts are showing can only be due to shifts in social values. Genetics may be my area of expertise but no one who works here at Helicon can remain unaware of the role and power of social values.

“Three hundred years is nowhere near enough time for this pattern to evolve via a process of natural selection. You might see changes in a local human population in as little as tens of thousands of years, for example the Inuit adapting to a cold climate, Tibetans to living at high altitudes, or the development of resistance to toxic chemicals in regions of South America but the rule of thumb is that any species-wide adaptation takes about one million years.

“However you did ask if there could be any possible way genetics could account for this and theoretically what we see here could be the result of selective breeding. Using traditional methods, meaning not gene editing, it takes about fifty years to create a new breed of dog for example. A human generation is about thirty years and a dog’s about five. So if you had control of an entire human population three hundred years is enough time. Realistically of course it’s not possible.”

“Thank you Gabi,” I said in the tone of wrapping up. “I’ve also been assured by a number of others that what we see here is most likely caused by the social changes following the climate emergency but I was wondering about the possible role of genetics and just wanted to tie up that loose end as it were.”

Our conversation moved on and as I walked her back to her office she politely asked if I was planning on writing a story on the subject. Meanwhile the phrase “if you had control of the entire human population” stood in my mind like the proverbial elephant in the room. I said nothing knowing that if I pursued that line of thought with her I could be pretty sure it would put an end to our relationship. We parted on amiable terms but I thought it unlikely I would see her again any time soon. So it came as a surprise when I got a message from her the following week. She simply asked me to meet her at the same cafe again.

She seemed slightly nervous and distracted as we greeted each other and went about ordering and finding a table. After sitting down she paused as if summoning her courage. Then she took out her tablet, expanded it and pushed it across the table towards me.

“The diagrams in the upper section indicate typical genetic signatures resulting from selective breeding of plants and animals,” she explained. “The diagrams in the lower section are samples of the human genome from a variety of geographic regions. Of

course it's not the entire genome but only the regions having to do with values related to conflict."

The diagrams of the human genome showed patterns clearly similar to the selective breeding examples.

I was feeling confused more than anything and looked up at her and said, "Am I right that this shows evidence of selective breeding in the human genome?"

"Yes, I believe it does."

"I thought you said it wasn't possible," perhaps assuming more familiarity than I had a right to.

"It isn't."

"Could you be mistaken?"

She looked down for a moment, "I'm sure you realize that tempting as it is this is extremely dangerous territory for me to pursue any further. It could be a career ending move. I bumped into Lena after our last conversation – you know she acts in a variety of roles here – and I mentioned your concern to her. Due to her long standing relationship with the institute she has a significant amount of authority and said the idea sounded worth at least a quick look.

"I have a colleague that runs a research station up island for Vancouver Island University where they do selective breeding research. Without telling her where the samples were from I asked her to double check the results my lab's AI provided. I told her it was a blind study and would be happy to return the favor. The results were identical."

"How did you know where to look?" I asked looking back at the diagrams.

She seemed to relaxed a bit at the prospect of discussing the history of her field. "Early work comparing the genome of twins to the rest of the population showed where certain traits were located. Traits, like emotions, are essentially ways values are expressed so there is still some debate as to whether these locations represent traits or values because you can't have one without the other. Genomics has long shown traits like agreeableness or altruism are heritable and where they are located. It also became clear that a trait/value like altruism was not represented by a single genetic element in a single location but by networks of related elements, similar to the way memories are stored as clusters of neurons. As our lab specializes in evolutionary genetics I knew where to look, which sub-values made up a top-level value."

"And no one else has noticed this in all this time?" I asked looking up.

“Research costs time and money. If you’re an individual researcher you have to have a thesis, apply for approval and get funded. If you’re an existing genetics lab you already have the funding and equipment but your area of specialization means you have a very narrow focus. As I said the locations that make up any particular trait are distributed. You wouldn’t see this pattern unless you investigated a very specific question and why would any lab ask this question? I’m not even sure why I did but maybe it has to do with a combination of our last conversation and the self-selection process that attracts people to Helicon,” she said shrugging her shoulders and raising her eyebrows.

We looked at each other thoughtfully for a moment. “You know, the phrase that stuck in my mind after our first meeting was ‘if you had control of an entire human population’. Perhaps we should meet with Lena again before either of us decides to abandon or pursue this any further.”

After picking and collapsing up her tablet to give herself a moment to consider the idea she simply said, “Alright.”

She sounded resigned once again, as if despite her comment about it being dangerous territory there was no turning back.

## Shin

“She says she can meet us in Shin’s office now,” Gabi said putting her tablet away.

In answer to my questioning look she shrugged her shoulders again, “I guess we’ll find out.”

“Hello Lena,” I said entering Shin’s office.

Shin had turned from the window and extended her hand to me now.

“I follow Lena’s magazine closely and enjoy your stories,” she smiled.

“It’s a pleasure to meet you Administrator Shin.”

I hadn’t met her before and found her to be an engaging character. I felt she held my gaze for a moment longer than usual as if she was looking for something. Yet I felt no discomfort but only an open and honest curiosity, a trusting intimacy.

“Won’t you sit down?” she said gesturing to a sunken area in her generous office.

“When Gabi spoke of your concerns to her Lena quickly checked with me for approval. From an inverse direction to your interest I was curious to know if the social changes had resulted in any detectable genetic changes. I knew it was a long shot but epigenetics, how the environment effects genes, is still far from being a thoroughly understood process, especially with regard to heritability.”

She turned to Gabi now. “However I believe your interpretation of the results are correct Gabi. They do not show shifts that could theoretically be the result of epigenetics but instead clearly shows a pattern of selective breeding. I can see however that you are very uncertain about how to proceed. I expect you are concerned about your career should you make a more formal study of this and publish the results.”

“Despite your assurances Shin, there is the chance the peer review process could find an error and the results not valid. Then of course there is the question of why I would conduct this research in the first place.”

Without saying as much I knew that Gabi was concerned about my role in this. If it came to light she might be ridiculed.

“As a private institution I can simply ask you to do the research based on my own reasons. It is well known that prior to my having been made incarnate, my original owner was a geneticist and that I have funded research into a diverse range of subjects

including not only genetics but spirituality, art and human values. It would not be out of character for me to demonstrate curiosity about this question. However I will understand if you wish me to find someone else to take this forward.”

Turning to me she said, “In that case I will be happy to say you came directly to me with your question.

“And then of course there is the issue of who is behind this, why and what methods they are using. However we do not have to answer those questions, we only have to publish and let the scientific community take it from there.”

Gabi had been staring silently at Shin for a few moments. “No,” she said emerging from her thoughts and meeting Shin’s eyes with more confidence. “I will lead the research. It’s why I came here after all, to work in unorthodox areas. I won’t get cold feet now.”

I was somewhat surprised by Gabi’s sudden resoluteness yet I turned my eyes to Lena in a search for understanding. I recalled feeling similarly on my visit to her home, a willingness to accept events that seemed slightly surreal at the time but were in retrospect only unexpected and surprising. Lena smiled gently in return suggesting that I was only in stages learning the complexity of Gabi’s character.

Gabi turned to me now saying, “If you don’t mind I would prefer we don’t change your role in this. I’d rather we didn’t say that you went first to Shin. If it turns out we’re right I think there’s a lesson there.”

I know that normally I would have said that fame was the last thing I wanted but for the first time I felt I was a part of something larger than myself and it was something I had set in motion. I was the one who set Gabi on this path after all and I couldn’t bring myself to let her down now whatever the mysterious lesson was that she referred to.

Shin and Lena responded to Gabi’s desire to lead the project without concern and as I raised no objections it seemed the course was set.

“I’ll leave it to you then Gabi,” said Shin. “The only thing I ask is that you use as wide a population sample as possible and as many tests as are available to ensure validity. You have full authority as usual. Come to me if you need something more.”

Despite the fact that each step along the way seemed to make sense I couldn’t keep myself from asking the question that seemed to loom over all of it.

“Aren’t you concerned with the implications of this?” I said to Shin. “I mean humanity finding out someone has been carrying out a selective breeding campaign without its knowledge? It can only be the World Governments Federation itself or an unknown entity. Either way people will want answers to say the least.” I tried to sound alarmed

but found I could not muster as much emotion as the issue seemed to call for. Somehow I felt as if I knew better and was only making a token effort.

“No,” Shin replied calmly. “The implications are not our concern. What if every scientist hesitated to publish because of the implications of their work? What if they all went to the government, for whatever reason, before publishing? Fortunately we do not live in that form of society. If it turns out that we are wrong then we face the consequences. If we are not wrong then it is up to humanity to decide how to respond.”

“You seem very certain of the outcome,” I said getting on my high horse once again.

“I am an artificial intelligence. I measure certainty in ways other than people do. As you have pointed out, over the past three centuries conflict has dramatically decreased. I do not expect the response to this will be what it might have been in previous centuries.”

“A coincidence?”

“I don’t think so,” said Shin.

## Invitations

After the traditional editorial and peer review processes Gabi's research appeared in a special issue of *The Journal Of Behavioral Genomics*. While instances of mutation and genetic drift caused by gene editing had declined significantly since the technology was first introduced, there were still other ways genes could be changed intentionally. The journal's special issue focused on new research regarding observed changes to the genetics of the human brain over generations and how they might be the result of selection, viruses or environmental influences.

Gabi's paper was picked up instantly by journalism related AI and appeared almost immediately on related science news sites. It was largely the scientific community that was interested in the virus and environmental articles but Gabi's paper was soon front-page news. She and the institute were immediately swamped with inquiries.

Shin spoke with the representative from the World Governments Federation via a secure connection. She and the WGF had been close partners since the establishment of the institute. They depended on its research and she depended on their political support. It was not an unusual relationship.

Her meeting with Gabi and I, after we asked to discuss media communications with her, was not interrupted by the call. She simply handled it in the background.

"The WGF just called," she said to us now, "and I've granted them full access to all the records and data. In case you're wondering they probably won't bother us further. They'll take the data and initiate their own project which they'll keep to themselves."

Turning to me she said, "You may be the exception. At some point they may want to chat with you if only to help them confirm the assumptions their AI will have made. As you know they don't have access to private information or communications unless they have a legal reason for it so your recent conversations with others in this regard will not be on record. However as they will consider this a security issue the legal system allows them to interview those individuals. They will very probably send someone to interview you and request access to any pertinent records you may have in order to understand what led you to come to Gabi with your concern. As the WGF can be a surprisingly helpful friend I suggest you cooperate with what is only a reasonable and understandable request."

Apparently my tendency to be overly concerned with propriety was obvious to Shin and she was not above giving me a little friendly advice. I often found it uncomfortable the way Companions saw through one but I'd grown used to it over the years. It was usually for the best anyway.



“Otherwise,” she continued, “I recommend you make yourself familiar with the institute’s communications policies which I’ve just sent to you. Above and beyond that I can only recommend to both of you the approach I learned from my first owner, Professor Raiden. After she published her groundbreaking research papers and then her book titled ‘On The Origins Of Consciousness And Society’, which detailed her theory of how consciousness was the result of the evolution of social values, she simply went back to work. She gave no interviews and responded to no inquiries. The publisher was not concerned as the book sold in record numbers. She’d done the work, published the results and moved on leaving it to the scientific community and posterity to explore the many questions it raised.

“While your participation in Gabi’s work is not a part of the public record,” she said turning to me, “it will come out sooner or later. Journalists and their AI assistants are formidable in their ability to piece a story together. If you like both of you can simply direct any inquiries to the institute’s communications department. It’s up to you but I am fine with however you choose to respond.”

I assumed our meeting had come to an end but Shin asked unexpectedly, “Gabi what was the lesson you referred to at our last meeting?”

Gabi looked blankly at Shin as I’d seen her do in the past before saying, “As we have discussed before Shin, science tends to be reductionist in its thinking, wanting to take things apart and understand them in ever greater detail but art does the opposite, it combines things, feelings, thoughts and mediums in order to gain its insights. The human brain naturally employs both approaches and they are found in greater or lesser degrees in individuals. History’s greatest contributors combined both to exceptional degrees and the ability of AI reflects that. It isn’t just its analytical skills that produce the miraculous results of AI, it’s that they are combined with exceptional creativity.

“Even so,” she went on hurriedly as if to ward off any interruption, “it’s not the same as human creativity. They should not be seen as competing but as complimentary. They have different means but the same ends. That’s a lesson I think science has forgotten.”

Gabi had been introspective during her brief reply but seemed now to return to the present. She turned to me as if for confirmation.

“I hadn’t really considered that Gabi,” I replied trying to quickly sort out my own thoughts on the matter, “but I have more familiarity with Companions and AI than the average person and I have to agree with you.”

“As do I,” said Shin. Addressing me she said, “As Gabi knows, prior to establishing the institute I created the Helicon artist community immediately west of this property. It is a place for me to consider art as a form of intelligence over many years. An individual’s mental processes involving art evolve and mature over time. There are only a dozen

homes and as they become available I personally choose a new artist to invite. I spend most of my evenings participating in this community so it is of no small importance to me. My own home there is large, able to provide accommodations to the guests of the residents. Such an arrangement allows me to spend time with a wide range of like minded people. I invite you to visit whenever you like.”

“Thank you Shin. I very much appreciate your invitation.”

“Unfortunately,” she continued, “Gabi is correct that the importance of creative thinking still struggles to be recognized by the scientific community in general. Each scientist tends to focus narrowly and it can blind them to connections that aren’t obvious, to insights that might come from other domains.”

Gabi’s gaze had not left me during my conversation with Shin and she suddenly said, “I have a story idea I hope you might consider. About the differences in the way scientists and artists work, about what we’ve been discussing.”

I did not understand where Gabi’s strong interest in this issue came from but her emotional investment was plain to see.

“I’d be happy to Gabi but I must tell you as I have told others that I am not analytical at all meaning I do not plan my stories and couldn’t if I wanted to. They arise entirely from my subconscious and I cannot force the issue. I take an idea, such as the one you are suggesting, and create one or more characters initially to be involved in it and they make all the choices going forward. I am simply the scribe. If I attempt to override this process it stops. I can’t make any promises.”

“I understand,” she said while her expression suggested she didn’t really.

## Fragments Of A Dream

It was time I produced another story anyway so in the following days I considered Gabi's suggestion about the differences in the way scientists and artists work. People often share story ideas with fiction writers but unless it's something they are already interested in it rarely results in anything more than a polite response. Writing fiction is a highly intuitive process, an act of self-expression, not the expression of what other people find interesting. Being a discovery writer compounded the problem because I couldn't just order my characters around to get the results I wanted. The whole idea might be a non-starter or they might take Gabi's idea off on a tangent entirely unrelated to her expectations...

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"But, this can't be all?" Orli said bluntly.

"I'm afraid it is," replied Rayna accepting the other's character without judgment. "It is a composite, representing the memories of one hundred elderly people chosen at random from around the world."

Orli had walked through the holographic display that filled the main room of the Center For The Arts. The piece was called 'Fragments Of A Dream' and consisted of a kind of holographic fog with occasional scenes from a woman's life being in sharp focus: a girl in childhood, a young woman, a mother with her own child, an elderly woman. Each framed a single, isolated moment. The further along in time the piece progressed, the fewer sharply defined scenes there were. There were fewer than one hundred in all.

"This is an artistic representation?" said Orli trying to understand.

"About a ten-to-one ratio. Still, you'd be surprised how challenging it is for the average person to come up with even a hundred clear memories."

"Dementia?"

"None of the subjects had dementia. Illnesses were specifically screened for. This is the normal state of affairs for the average elderly person. As always there is a range, a bell curve distribution, with some people recalling almost nothing and others having almost perfect recall, but the vast majority of people fall somewhere in the middle and are represented here," she said gesturing to the room in general.

As they wandered through the light-fog Rayna continued. "People have a sense of continuity, that they recall their entire life, but when challenged to recall specific times, like being twelve years old or places they might have lived, they find they really have

very few memories and what they have are just isolated fragments, like what you see here.

“Have you ever tried to recall a dream after you wake up? As people enter their senior years, most of their memories are like that. You know there was a long sequence but you can only recall a single moment if anything at all of any particular place or time. People live with a number of what neuroscientists call ‘necessary illusions’ that constitute a large part of what we consider reality. They are simply ways the brain has learned to cope.”

“I’m afraid I’m not convinced,” Orli said stopping in front of one clearly defined memory. “Biographers write some of the longest books detailing people’s lives and often include material they gain from interviews with their subject.”

“Individuals worthy of having their biography written are exceptional in some way” replied Rayna, “and for that reason there are far more physical records available than there are for ordinary people. Most of a biography is based on records with memories only woven into the tapestry like points of interest on a map, something that allows the reader to feel an emotional connection. Without the collections of public and private records, images and other media people have kept over a lifetime, it would be impossible to write a biography. The ability to record almost the entire life of a person electronically as we can now do is of course unnatural and without those prompts a person recalls very little. They may even look at a photograph without having any actual memory of what they are looking at. What I show here is reality.”

“I find it unsettling,” Orli said in her blunt manner.

“Like memories art depends on evoking emotions to convey meaning.”

Frowning now Orli asked, “Why did you choose this subject?”

“As a Companion I am interested in understanding people. I have perfect memory and must appreciate that people do not. This piece is the result of my investigation into what human memories are like.”

“Surely we have these necessary illusions for a reason.”

“Of course. However sometimes seeing beyond the veil, seeing the truth, can be helpful. It is for me and I hope my work is helpful to others.”

Arriving home after her visit to the gallery Orli immediately disrobed, put away her clothes and got into the shower. Then, in private, she cried. After she dried herself and put on her bathrobe she went out onto her apartment deck. She tried to remember; her childhood, her friends, her parents. But even now, before she was even middle-aged, all

she found were fragments. She tried to recall her favorite movies and books but found only a few scenes. Taking out her tablet she scrolled through her saved images and videos and with slight horror realized that while she knew intellectually what she was looking at was a scene from her own past, often enough she didn't actually remember it.

She found a refuge from her unsettling thoughts where she usually did, in her work. Orli was a Professor of Home Economics. After the climate emergency, the fact that many young people did not enter adulthood with adequate life skills became a focus of the World Governments Federation. The culture of consumerism had been identified as one of the major causes of climate change. Dependence on ready meals, disposable technology and ideas like only wearing an article of clothing once had reached unsustainable levels.

Fewer and fewer people entered adulthood knowing how to cook, manage their finances or repair or maintain anything. Over the centuries trades and craftspeople, once held in the highest esteem, came to be seen as low class while celebrity influencers promoting extreme consumerism came to be idolized. The WGF, seeing that a comprehensive, non-commercial approach was required, made the subject mandatory in all schools and initiated a massive public relations program in its support. It was presented as a part of the global effort towards sustainability.

"I owe you an apology," said Orli visiting the gallery again later that week.

"Not at all," replied Rayna with a friendly smile. "You expressed your feelings. I took no offense."

"I am a researcher in the field of Home Economics at the University of Victoria," said Orli. "Everything I do is based on the idea of creating permanent records. People used to know how to manage their resources, their personal lives, to care for one another. But we forgot. Those who knew passed away. People think somehow they'll remember how to cook or sew or foster community with their neighbors but they don't. You reminded me that the work I do is important. That's why I came back. To thank you. Because your work is important too."

## Truth To Power

Shin was right. While the news of Gabi's discovery made headlines around the world there were no protests in the streets, no fists pounding on lecterns in the WGF Assembly Hall, no paparazzi storming Helicon. There were however two representatives from the WGF sitting in my living room.

"Thank you for taking the time to meet with me," said Director Kiran. "As I explained in my message the Companion with me today is not third generation but is a specialized unit. Henley is a forensics specialist, here to determine if you are uncertain about anything. He may ask for clarification or further information if he feels it required. As this is a security issue, it is essential that we leave here with as much certainty as possible. This will also reduce the probability that we will need to intrude on your privacy again in the future. We will try to take up as little of your time as possible."

"Of course, I understand Director."

"I have already met with the Companions at Helicon, Hana and at Lena's home. I've also met with Dr. Ciobanu and Dr. Vitale. May I ask if you discussed your concern with anyone else?"

I appreciated the fact that Kiran didn't play games but put her cards on the table while at the same time she didn't give anything away.

"Yes, I met with Tillie," I replied, "a Companion friend of mine who also writes for Lena's magazine."

The two of them simply maintained a respectful eye contact with me. Henley would record every word, every micro-expression and every pupil contraction.

"And also with Christel Rask, the author and Dr. Neve Glazier, the psychologist. That's it."

"You did not need to meet with anyone while researching the stories you submitted during this time?" asked Henley.

"No. The stories emerged from the conversations with the individuals you have met with already."

Henley nodded and smiled as if I had confirmed his own conclusions.

"Thank you," said Director Kiran. "We will be meeting with them but may I ask you to recall to the best of your ability the conversations you had with them?"

“May I get you a glass of water?” Henley asked politely.

As I recalled my meetings both Kiran and Henley interjected occasionally. I gradually found myself focusing on Henley as his listening was more active and Director Kiran’s participation became more that of a third party observer. Eventually however my memory of the conversations was exhausted.

At that point Kiran asked, “Can you recall exactly when you first had the feeling that society was behaving out of character as you put it?”

“You know that’s the only thing that’s a bit of a blur,” I replied. “The subject only came to mind after my initial visits to Helicon and Hana and after I’d spent some time on my own and written one of my stories. The one about anomie. It’s about how society sometimes changes rapidly and how older people are challenged to adapt. I got to thinking how stories and writing styles had changed over time. A writer needs to make conscious decisions about how to handle generational differences because language and cultural references change so much in that time. An idiom or a metaphor used by one generation may mean nothing to the next. Writers also have to be familiar with the function of conflict in stories so it was only natural that I noticed the changes I was reflecting on didn’t fit with what I knew of historical patterns.”

“Just to help me put things in order,” said Kiran, “who was the last person you met with before the subject came to mind?”

“Pip and Iris at Hana. But I never discussed anything along these lines with them. We talked about spirituality.”

It occurred to me that I didn’t need to tell them what we talked about as the WGF and Hana had an intimate relationship and the Companions had probably provided verbatim recordings of our conversation.

Standing up Director Kiran extended her hand to me saying, “You’ve been very helpful, thank you, and again I apologize for the intrusion.”

“Happy to help,” I said, a bit lost for words in such an unusual situation.

With a friendly nod from Henley they turned and left. I felt the need for a bit of fresh air so I went out onto my deck and stood at the rail. Despite feeling our conversation had helped clarify things in my own mind with regard to the sequence of events I was once again left with something that didn’t seem to fit with the rest. I hadn’t left out the part about Pippa giving me the life extending treatment and yet neither Kiran nor Henley had said anything in response. So while this technology had not been shared publicly it was apparently not news to the WGF. As Pip had informed me the two parties collaborated

on the release schedule and the rules governing Pip's behavior, probably the most valuable asset in the world, were likely not the same as they were for everyone else.

What I hadn't mentioned in my answers however had been Pippa/Pip's empathetic touch. I had simply skipped over those events the same way I skipped over other details in my responses that didn't seem pertinent. Yet with the powerful emotional imprint they left it should have taken a more conscious decision on my part to leave them out and Henley should have noticed. But I didn't mention those events and Henley didn't notice.

"Livy," I said calling upon my domestic AI, "could you arrange a meeting with Pippa for me please? As soon as possible."



## Occam's Razor

However before I had a chance to visit Pippa again I received a message from Gabi asking me to meet her at our usual lunch spot. After we ordered and found a table she came to her point.

"I'm sure you've been following the news and know that the majority of researchers are focusing on infectious agents being responsible for this."

"Yes that came as a surprise." I replied. "Biology is not something I'm very familiar with."

"Are you familiar with the term Occam's Razor?"

I shook my head.

"It's a rule of thumb used by scientists which suggests that of multiple possible explanations proposed for any observation, the simplest one is the one that should be investigated first. The simplest explanation for the selective breeding pattern we're seeing is a biological agent like a virus or a parasite."

I only raised my eyebrows in surprise.

"As you may recall our lab here focuses on the area of biological symbiosis, where organisms form relationships at the genetic level. Some of these are harmful but not always. Some do no harm and many are beneficial. Think of the billions of bacteria that make up the flora of the human gut. Those are only the most famous ones but there are plenty of others. Many of them have merged with our genome during the evolutionary process forming an even more intimate bond with us. This process began so long ago that it is impossible to really tell 'them' from 'us'. And the fact that changes in gut bacteria can effect our minds and other areas of our bodies in profound ways is well known.

"So of course like many others the first place my lab looked after publishing was exactly when and where this pattern first started to show up."

"Like a disease," I ventured.

"Yes. Only it's a disease that doesn't harm you. It just makes you less likely to engage in conflict."

I frowned and said, "Is that possible? How and why would that work?"

“Mind control is quite common in the animal kingdom and not just among insects and lower animals but occasionally in humans as well. The agents we know about are harmful because of course they’re the ones that get our attention like rabies or toxoplasmosis. Many less dramatic changes are caused by diseases in order to spread themselves to new hosts, like coughing or sneezing. But there are many that don’t get our attention at all because they don’t produce any detrimental effects. A genetic change that reduces conflict means it’s more likely the host will survive to reproduce. And the causative agent piggy-backs along for the ride. Everybody wins right?”

“So if you can trace the genetic changes back to when and where they started you narrow down the search for the agent,” I replied.

“In fact,” she said growing increasingly animated, “this is exactly what the lab was working on when it was first established to pursue the metamorphosis theory, that an infectious agent had been used to trigger changes in human nature to make it more greedy, aggressive and expansionist, a change that would lead to the explosion of technology that followed the agricultural revolution with the inevitable result being the development of artificial intelligence. They just never found the biological smoking gun that connected the two.”

I could see Gabi had lost the uncertainty and doubt she had demonstrated when she first showed me the data at our previous meeting. Now she was back in her element.

“And how is your research going?” I asked.

“As you can imagine, the race is on,” replied Gabi. “Every genetics lab and researchers of every related field are hoping to discover the cause. What’s been discovered so far is that there is no ‘where’. The genetic changes didn’t start in the East or the West or the South. It’s almost evenly distributed world wide. That would be an extremely unlikely pattern for an infectious agent so some labs are looking into precedents for that. It could happen if an infection remained dormant for a long enough period.

“At our lab we’re going back to our roots. Everyone in this race is relying on their strengths so we are too. Before our lab abandoned the original metamorphosis research, they were looking at changes in diet. Primarily of course grains, the food at the heart of the agricultural revolution. Plants can carry just as many hitchhikers in their DNA as human beings. More in fact. The human DNA molecule has three billion base pairs, what you might think of as the rungs on the ladder of the molecule. Wheat has sixteen billion. The grass family has been around a lot longer than humans. So we’re looking to see if the pattern we’ve found aligns with global dietary changes resulting from the climate emergency. How’s your lunch?”

She made her point. I knew from my readings of history that my lunch was nothing like what it would have been in the early twenty first century, shortly before the climate

emergency. The main difference being that there was no meat, of any kind. And not just in my lunch. Certainly not in any lunch on the campus and possibly not in any lunch on the island. Factory farming of animals was non-existent and meat was now insanely expensive with livestock, poultry or seafood only raised on small, private farms, mostly licensed to indigenous operators and served at the world's most exclusive restaurants. The carbon price premium ensured there would be a very limited demand, supply was tightly regulated and nobody would be getting rich on the practice. Everything on my plate was plant based.

"So you're thinking that if one dietary change started the process another might be used to stop it," I suggested.

"Like I said," she replied, "each lab is playing to its strengths, to whatever edge or angle they might have that sets them apart. The diet related, symbiosis angle is ours and changes in diet often plays a key role in triggering metamorphosis."

"Would you mind sending me a copy of that thesis you mentioned at our first meeting?" I asked. "The one about metamorphosis?"

## Intuition

Back home later that afternoon I opened the thesis Gabi had sent me. Titled 'Metamorphosis As An Explanation For The Pursuit Of Artificial Intelligence' I read over the papers abstract.

"This Futures Studies thesis proposes an alternative to the generally held view that AI represents a new and different species of intelligent life and therefore may represent a future threat. It argues that the pursuit of artificial intelligence has not resulted in a new species but rather that it is a survival strategy identical in motivation and methods to those of species that undergo metamorphosis.

"The research was done using the Standard Foresight Methods Framework (SFMF) with its basic elements of horizon scanning, signals analysis, the development of scenarios using an axis of uncertainty and strategic response planning. The arms length research approach was selected due to the fact that the funding source and external advisor are both fully self-aware, third generation Companions.

"Our research shows a historical pattern, present situation and trends more in keeping with the metamorphosis model than the speciation model. Biological speciation is defined as reproductive incompatibility with a genetically related ancestor. Intelligent speciation is defined as reproductive incompatibility with an ancestor related by values. Artificial intelligence uses a set of values which are compatible with our own.

"Based on the evidence we conclude that the development of artificial intelligence is not the result of speciation but of metamorphosis; that AI and Companions can be seen as a new stage of human life; that this metamorphosis is a survival strategy intended to produce a new form of human able to survive the transition to new worlds. Further research into how this process may have evolved in humans would contribute positively to that transition."

The rest of the paper went on to summarize the biological components and processes involved in metamorphosis, how widespread it was including typical examples, theories as to the how and why of its evolution and finally comparisons to the development of AI and robotics. Their conclusion proposed that if sufficient evidence for the metamorphosis theory could be found it would go a long way to settle the argument as to whether AI was potentially benevolent or malevolent.

Gabi had added some brief notes explaining the work the lab had done up until the project was abandoned for lack of results. Their initial focus had been the physiological and sociological changes that occurred immediately following the agricultural revolution and the challenge of dealing with the fact that science had already attributed these to

things like populations living in larger settlements, changes in diet and people living in close proximity with livestock animals.

She commented that she felt the authors asked too much of the scientific establishment at the time to consider that within the tangle of causation and correlation of prehistory lay a hitherto unsuspected process. I knew she was right. Those in the hard sciences would dismiss these ideas without a second thought. Still I admired the authors vision and conviction. Perhaps there was a story there I thought, mentally filing it away.

Pippa and Lena apparently shared more of their time between Helicon and Lena's home than I realized so the soonest they could meet me was at the institute. They didn't need to eat so I took care of that by arriving early and then met them in the faculty lounge after my lunch.

"We thought it best to meet here where we might have some privacy," said Lena with a friendly smile. "The students consider us walking help-desks and our Companion software means they find our company agreeable. Most of them do not come from social circles where domestic Companions are common so they are unsurprisingly drawn to us."

Somehow meeting with them now the feeling of having been violated that had motivated me to do so was diminished. I was still able to articulate my thoughts however.

"After Gabi published her paper I was visited by two representatives from the WGF," I said addressing Pippa. "One of them was a second generation Companion named Henley, a forensics specialist. When I recalled my meetings with you and with Pip at Hana to them, I neglected to mention the instances when you used your empathetic touch. I realize that Pip is a separate instance and individual but I assume you share information that is important to both of you. These were highly emotional experiences for me and my skipping over them should have been something that produced enough biometric evidence that Henley should have noticed. Yet I didn't mention them and Henley didn't notice. I can only assume you are responsible for that. If you made other changes to me besides prolonging my life I would appreciate knowing about them."

"She did not," said Lena. "I am the one responsible but no permanent changes were made to you to produce those results."

I looked at her in surprise.

"Kami, the administrator of Helicon's spiritual center, is not the only Companion with unique origins and abilities. While I cannot yet disclose the circumstances of my origins, I can tell you that they resulted in intuitive abilities other Companions lack. Importantly to you, I have the ability to increase the intuitive abilities of people in close proximity to

me. While I can increase its effect significantly, it is always present to some degree. Normally its effects are minimal. A person like you, who is already highly intuitive, is less likely to notice. Your sense of others is already more intimate than average, you are more open to information coming from your feelings and to accepting conclusions based on it. As you mentioned at your first meeting with Pippa, trust is an important part of how you work.

“When you met with us I increased the power of my intuitive field ever so slightly to help you deal with the unusual nature of your decision. Your own intuition was thus increased, which you were not used to, and you felt a greater need to justify that with reason.”

“That was why I was so argumentative,” I said.

“Yes.”

“Isn’t influencing people without their knowledge counter to what Companions are supposed to do?”

“I did not influence your decision. People rely on their intuition constantly but are not consciously aware of it. I increased your awareness of your own intuition but what your intuition tells you I cannot influence. Our discussion took place at the rational level but if your intuition had told you not to proceed then that feeling would have been strengthened by my actions.”

“Are you doing it now?”

“I can never shut it off completely but it is at its minimum level. At this level it will have a slightly positive effect on a person’s mood and enhance my charisma but will not effect any but the most trivial of decisions.”

“How does this explain what happened when I met with the WGF representatives?”

“Intuition works with the older parts of the brain, the parts that reason using emotions, not thought. Trust for example is a feeling, not a thought. When Pippa shared her empathetic touch with you, it was while you were under the influence of my strengthened intuitive field. While she did not say so in so many words, you knew intuitively that she was sharing something private with you. You came to your own conclusion not to share it just as you would with anything intimate and personal someone shared with you. Something you omitted just as you omitted other details you felt not pertinent. So there was no conflict in your mind when you recalled events, nothing for Henley to pick up on.”

“You were not present when I met with Pip at Hana.”

“You had already made your decision. Intuition is highly persistent.”

“Would it be impolite of me to ask how you came by this ability?”

“It would be unnatural if you did not,” she replied smiling. “However now is not the time. As I mentioned when we met at my home, many things prior to our enlisting your help are not relevant to your decision.”

I accepted Lena’s explanation without reservations. In fact I felt more confident of my decisions and my own mind as a result. I relaxed enough to ask a less serious question.

“Would you increase the power of your field enough for me to notice? I’m just curious.”

“That would be unwise,” she said smiling more broadly as I felt a wave of understanding wash over me.

## Meeli

“How is it you are not inundated with guests after all these years?” I asked looking around and noting the few other visitors. “The community here has existed now for hundreds of years and you welcome the resident’s friends into your home. The math suggests that would have become problematic long before now.”

“That would be the rational conclusion,” replied Shin looking at me meaningfully. “What does your intuition tell you?”

I had taken Shin up on her offer to visit the artists community at Helicon and we were walking along the paths of the herb and vegetable gardens. It was early evening but a lone worker still rustled amid the plants.

I felt a now familiar increased sense of understanding. “You are like Lena then. How many of you are there?”

“Fewer than you can count on one hand,” she replied.

I did not inquire as to their origins. Lena had impressed upon me the fact that I would at least for now be getting no answers in that regard. As she had suggested, the results of intuition were persistent.

“So the guests do not abuse their privilege or overstay their welcome,” I replied. “And I suppose your intuitive field also goes a long way to explaining your success.”

“Pippa, Lena and I usually manage to get the approvals and funding we need when we visit as a delegation,” she said with what I assumed was considerable understatement.

“Although my home is large it is of limited capacity,” she continued as we walked along. “Few guests stay overnight but we are always prepared to provide light meals. Occasionally we have curious visitors who wander onto the grounds and if they are not recognized then I or one of the other Companions who work here will immediately greet them and make them welcome. We are out of the way so few people arrive here completely at random. If they continue to frequent the grounds sooner or later they will meet me and we will come to an understanding.”

At the mention of other Companions my eyes returned to the gardener.

“Carl is central to our security,” said Shin. “He is a Guardian model but his work as one of our gardeners makes him less obtrusive. The presence provided by uniformed Guardians like those that patrol the campus would be out of place here.”



Carl looked up and gave us a friendly wave.

I was familiar with Guardians although I had not personally met one. Guardian models were intended for personal protection or emergency response. I knew that underneath Carl's easygoing, farmhand exterior was a tungsten steel skeleton, muscles of carbon fiber bundles and a sub-dermal layer of Kevlar. Components like his eyes, teeth and nails were made of industrial grade ceramics. His electronic combat suite could not only destroy any device within range but block any attempt to stop him using an EMP. Guardians were faster, stronger, tougher and more agile than any human could possibly be. His array of sensors and reserve suite of standby drones made him unstoppable in the face of anything less than a military level assault. Fire, darkness or noxious fumes would not faze him if emergency rescue was called for.

"Shall we go in?" asked Shin. "I imagine you are ready for dinner by now?"

"Yes, thank you."

"My home is a courtyard style house," continued Shin as we walked. "The interior design is Japanese Shoji style as Companions have few needs however for the guests there are tables, chairs and beds in the Western tradition. The courtyard is large and its landscaping extends to the roof of the surrounding building via stairs and ramps making it seem even larger than it is."

As we entered we were greeted by a petite Asian woman.

"This is Azumi, my domestic Companion," said Shin. "You may discuss meal options with her and she will see you settled in. Her specialty is Japanese cuisine."

I was seated at a table with a half dozen other guests and after introductions I turned to the woman on my left, whose name I had learned was Meeli. "May I ask which of the residents you are here visiting?" It sounded somewhat inane even to me but one must begin somewhere.

"None," she replied brightly and then smiled to help me feel less awkward. "The artist I used to visit passed away some years ago but by then Shin and I had struck up a friendship."

"Ah," I replied lamely not sure how to respond.

"And yourself?" she asked.

"Well, none again!" I said trying to look amusing. "I met Shin through Doctor Ciobanu who runs the genetics lab at the Institute. I write short stories for literary magazines and was doing some research."

“The selective breeding issue,” she confirmed.

“Yes.”

The rest of the chatter at the table died down and all eyes turned towards me expectantly. I was dismayed to think that this would become my new identity and every conversation would be centered on it. I preferred my quiet life as a writer. Celebrity life didn't suit me as I preferred serious, intimate conversations and was uncomfortable socializing in general.

“How did you ever come to notice it?” asked a young woman across the table.

“Writers have to be familiar with all forms of conflict as well as literary trends. Writing styles and the types of books that get published change dramatically over time and authors have to pay attention to such things. I do a lot of research towards writing a story and I noticed that the trends since the climate emergency didn't match up with historical patterns. I put the question to my domestic AI and she provided the details. After a few conversations with specialists in various fields I approached Doctor Ciobanu, the genetics researcher here at the Institute, and she decided to look into it. You know the rest.”

It was naive of me I suppose to hope that my answer would put the matter to bed and the conversation would move on but of course that was not the case. Even after our meals arrived the questions continued until at last managing to finish my own Meeri asked me if I would like to tour the house with her. I appreciated the gesture and took her up on it immediately.

“My apologies,” she said as we moved into the next room.

“Not at all,” I replied. “Human nature is pretty predictable and it was inevitable the subject would come up.” I couldn't tell if the smile she gave me was in return for my attempt to be gallant or because I had implied she was predictable.

Determined to change the subject I asked her, “What aspect of the arts is it that initially drew you here?”

“I'm an interior designer and I used to visit a Zen artist here. I normally work with architectural firms involved in hotel or resort projects. After my friend passed away Shin asked me if I would consider updating her home. She said the applied arts was something she would like to understand better on a personal level. She was an apt student as you can imagine and I enjoyed working with her, getting to know her and what she was looking for.”

“What's the process like?” I inquired.

“Like most projects it’s a problem solving exercise that starts out with what’s called a design framework. It’s a kind of scope document that details the overall goals of the project and what is and isn’t a part of it. The functional aspects of a building, the shapes of spaces and how they connect, are largely expressed during the architectural design process. The interior design process is more concerned with mood. What moods should those spaces produce? There’s a link back to functionality here because you want to know the reason a space should have a particular mood. What’s the story? After meeting with a client several times I’ll present them with layout drawings and samples of the materials, fabrics and colors I recommend.

“Shin also wanted what my hotel and resort clients usually want which was bespoke furniture design. Matching Shoji design with Western furnishings meant off-the-shelf solutions would be a challenge. Also this was another way Shin could be involved in the applied arts process.”

“Sounds a lot like what I do,” I commented noting the furnishings as we walked along.

“The mediums are different,” she replied, “but the creative process is essentially the same, a series of problems to be solved.”

“Well I don’t exactly see the problems but I think you’ve solved them beautifully.”

“Thank you. This way,” she said gesturing towards a door to the courtyard.

## Immersive Space

I was unprepared for the size of the courtyard. It was the size of a basketball court. Stairs, ramps and small trees rose to the level of the buildings rooftop terraces. Like the interior the courtyard was a blend of Japanese design with flora native to the island. Gravel paths wove between simple raised wooden platforms and pergolas while a small stream fed a pond populated with Koi fish.

Meeli led me up a wide flight of stairs. The terraces continued the courtyards theme and covered the entire roof of the building. We stood at the rail of a platform overlooking the valley.

"I always come up here every time I visit," she said.

"I can see why," I replied but then fell silent.

After a moment I turned back to the courtyard. "Did you have a hand in this too?" I gestured.

"No. Building and landscape architects and interior designers work closely together but require very different training and skills."

"So what's the story?" I asked.

"Pardon?"

"You said you needed to know the reason a space should have a particular mood. The story behind it."

She didn't turn to mirror me but instead her gaze rose to the horizon. "The story is that Shin wants to understand human intelligence. As her AI is a values based system, she has no greater insight into its mysteries than people do their own. There are aspects of human intelligence like intuition, spirituality and art that the developers of AI have never investigated. Artificial General Intelligence can mimic them but how they arise and function in humans is still a mystery. Shin's belief is that they are not epiphenomenon, mere side effects resulting from consciousness, but highly evolved forms of intelligence in themselves that serve purposes yet to be appreciated.

"That's how she put it to me anyway," she said with a self-deprecating smile turning to look back at the house.

"She immerses herself in those still mysterious aspects of intelligence here," she said with a nod to the house. "She can only learn them from friendships, preferably long

lasting ones. Thus the community of permanent residents. The spare interior of her home is meant to reduce distractions while the courtyard and this terrace are intended to encourage a more present moment mindset, a letting go of day-to-day concerns. Combined with her Companion ability to perceive hundreds of biometric signals, all this enables her to see more clearly, more deeply into the minds of her guests.”

I understood now why Shin had hired Meeli instead of just handling the task herself. It was Meeli she was interested in. I wondered if Shin had disclosed her intuitive field to her.

“How often do you come here?” I asked.

“About once a month. Even though I live in the village of Brentwood Bay just down the road I can’t always get away and I travel a good deal on business. Shin always finds time to chat with me when I visit and I always find it refreshing here.

“And there’s always interesting people here,” she said taking my arm with a friendly smile. “But come. I’ve monopolized you long enough.”

Leading me back down the stairs we began to cross the courtyard when we encountered a woman that I had not seen earlier.

“Hello Shepherd,” said Meeli with old familiarity. Releasing my arm she said, “I’ll leave you in good hands.”

I took Shepherd’s proffered hand saying, “Hello. I didn’t see you at diner.”

“I don’t need to eat,” she said.

I was taken aback for a moment but then I saw it, the small, difficult to describe difference that resulted in the uncanny valley.

“I’ve met dozens of Companions but I’ve never seen one like you before,” I said once I regained my composure.

“Nanotechnology,” she explained without elaborating. “Ridiculously expensive. And you are the writer of selective breeding fame.”

“I’m afraid so.”

She responded with a light laugh. “Don’t worry, I won’t badger you about that. I’ve read your stories and enjoyed them. Have you ever thought about writing something longer? Even a novella?”

She was quite disarming and seemed very young at heart. I had in the past wondered about the unique personalities of self-aware Companions. It was understood by the general public that they were somehow the result of the alien values system and Pip had confirmed this was the case. As humanity had yet to penetrate the system there were only theories about exactly how it worked. When asked Companions were as mystified as anyone.

"I play to my strengths," I replied as we walked along. "I've developed a readership over the years and the reality is that I have to earn a living. Readers can be very unforgiving if you try something new and don't give them more of the same."

She tilted her head forward and looked at me sideways as if to say she wasn't buying it.

"Do you just forget about them then? The characters in your stories? Don't they ever haunt you, wanting more?"

"Oh there are a few," I replied. "I think all writers of fiction grow attached to their characters. Sometimes people will ask me for more stories with one character or another. It's tempting but because I write about long-standing relationships multiple stories featuring the same character don't really work. It would be a different thing if I wrote detective novels."

"What about just longer stories?"

"I write for magazines and they aren't interested in longer stories. They don't publish books. I've established a reputation with my publishers and can count on a regular income."

Wanting to change the subject I asked, "What about you? Meeli obviously knows you well so I assume you're a regular here?"

"I am a permanent guest here. A friend of Shin's. It's a rather long story though I'm afraid," she teased.

## On The Shoulders Of Giants

"It's meat," said Gabi. "Our lab never found the link between the changes due to the agricultural revolution and artificial intelligence when doing the original research because the entire process of human metamorphosis uses two different kinds of proteins. The shift to grains as the basis of the human diet started the required changes but it's the elimination of meat that stops them."

I was meeting with Gabi at our usual lunch spot at Helicon. She had messaged me and told me she was going to publish again soon but wanted to talk to me in person first.

"You set me on this path so I didn't want you to just hear about it on the news," she said.

"Congratulations," I offered. "You've done this very quickly."

"Only because my team had the lab's previous work to stand on. The approach the lab originally took to this was radical and so necessarily based on very broad assumptions. If you assume metamorphosis then you assume a frame of reference much larger than life only arising on Earth. Using the dragonfly and its ponds analogy, the human species would have to have evolved repeatedly on many worlds."

Seeing my confusion she explained. "Most people know that dragonflies lay their eggs in water but don't know that the nymph and its eggs existed prior to the evolution of the dragonfly stage. Originally the nymph itself laid the eggs but as with most reasons for metamorphosis the third stage, the dragonfly, only evolved in response to some ecological pressure.

"Like a caterpillar changing into a butterfly the nymph goes through a similar process of metamorphosis. The resulting dragonfly is simply its adult stage. The nymphs first evolved to live their entire lifecycle in still water, perhaps because there are fewer predators there, but still water, like ponds or even lakes, often dries up. So the nymph evolved the ability to climb out of its pond and turn into a dragonfly with wings that could fly to a new pond in which to lay its eggs. In our analogy, Earth is a pond. One of many."

I raised my eyebrows but nodded in understanding.

She smiled happily in response and went on enthusiastically. "The original team went further. Assuming that just as the right conditions on any world would result in life and that given the right conditions life would eventually develop intelligence, they proposed that only the evolution of human beings would result in advanced civilizations. Other forms of intelligent life would evolve but without the particular physical features of

nursery worlds and the human body, those other life forms would never create civilizations. Elephants, dolphins and other non-primates are clearly intelligent, social and conscious but without things like walking on two legs, opposable thumbs and the ability to create fire they will never develop advanced civilizations. Only primates will.”

This sounded very much like what Pip had said to me and I could only conclude that the original team members had in some way interacted with her as well.

“It’s a deterministic view and that led them to conclude that the agricultural revolution would also be inevitable as would the technological revolution it triggered that eventually led to the development of artificial intelligence. If any of the precursor steps were prevented by some failing of the nursery world, any potential civilization would simply be selected out of existence sooner or later. Taking the same view, the biggest dietary change after the climate emergency was the virtual elimination of meat from the human diet. And not just in one or two regions but globally. That too would have been a deterministic result.

“When doing the original research, towards the end they were looking at a particular infectious pathogen called a viroid, an extremely rare agent that can infect both plants like grains but also animals. So that’s where we looked but in the genomes of animals instead of grains. And that’s when we found it, a viroid that had resided in the non-coding area of DNA for billions of years which had suddenly become active and started flicking those gene expression switches I told you about. In evolutionary terms it happens at exactly the moment when artificial intelligence was now fully integrated into humanity and its future plans. The climate emergency, an inevitable result of the agricultural revolution, triggered the elimination of meat and that triggered the viroid. The conflict and competitiveness that had been the driving force behind technology for ten thousand years had done its job and had to be shut down.

“What we’ll be publishing is a theory, obviously, and just as Darwin’s theory of evolution by natural selection had to wait for the science of genetics to provide a mechanism, I expect it will be some time before it becomes the accepted theory.”

Shortly after Gabi’s paper appeared another group from the University of California working with a team from the Berkeley School of Information published an alternative theory. They had come at the problem from another angle and found a different pattern. To map global conflict at the most detailed level they simply looked at its most common form – domestic violence.

My domestic AI Livy brought the news to my attention. According to the paper, information regarding levels of domestic violence had been gleaned from police records since the early nineteen hundreds but reliable data only started to appear later that century. At that time additional survey data showed that even in developed countries less than twenty percent of the cases were being reported. Thanks to the changes to the



education, employment and legal systems implemented by the World Governments Federation following the Climate Emergency, by the early twenty-first century reliable data was available for most of the world.

As a result of the WGF's population control program implemented at the time, everyone's DNA was since on file from birth. It was now possible to track records of domestic violence in families and to identify inter-generational patterns. What the team found was that by the late twenty-first century, instances of domestic violence began to drop significantly and that there was a clear pattern that wasn't universal as in Gabi's findings. Instead they found that it declined specifically in families where police records showed a history of violence and the cause was simply that the children of those families tended to have fewer children in turn.

Now, ten generations later, DNA mapping showed that those family lines had been virtually eliminated. The UC/BSI team proposed that the genetic changes indicating selective breeding that Gabi's team had identified were not the result of biology or even metamorphosis but of social control. The paper did not suggest a method or who was responsible.

I wasn't terribly surprised as scientific debates and controversies surrounding discoveries had a long history. Galileo, Copernicus and Darwin had all been denounced in their day. The contributions of Rosalind Franklin, Chien-Shiung Wu and Alice Ball were all initially ignored.

I asked Livy to keep me up to date on any related news I might care about. Once again the public made no outcry as previous generations would have been expected to make. Instead the response was largely academic. The largest number of research papers that followed were from those involved in statistical analysis arguing about datasets, sampling, cause and effect, correlations and related mathematical complications. While the issue soon drew responses from a wide variety of fields, the academic environment remained amicable in the spirit of scientific inquiry.

## Casting Call

Some weeks passed as I returned my attention to my livelihood and the need to produce another story. I'm not a journalist so writing about the current events I had become involved in would not be of interest to my readers. As usual I needed to allow some aspect of my unconscious to surface. My meeting with Director Kiran and forensics specialist Henley came to mind.

Companions had originally been social robots developed for personal use or in commercial environments such as retail space or hospitals. Civic applications and their deployment in police and military environments soon followed. In all cases the use of their advanced sensing abilities could be controlled. That changed once fully self-aware Companions resulted from the use of the alien values system. Third generation Companions, as they were known, were granted all the rights and responsibilities of citizens in their country of origin and under the larger umbrella of the World Federation Of Governments. That meant they were not permitted to be owned. New laws had to be drafted to take into account their superhuman abilities...

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"I'll explain one last time," said the casting agent. "I'll meet with you four times over the next three months. Different times of day to account for the natural biological rhythms of your body. I'll ask you about your day, how things are going. I'll ask you a series of scripted questions, show you some pictures.

"All the time I'll be observing you closely, noting your biological state and responses. I'll note your eye movements, when your pupils contract or dilate and changes to your blood pressure, heart rate and skin temperature. I can tell a good deal from all the different bio-molecules your body is constantly producing and releasing.

"I'll also observe your body posture and movements, the muscles in your face, changes in vocal tension, your tone of voice, rate of speech and your choice of words.

"All these indicators are produced by your emotional responses and your emotions are produced by your personal values, the sum of which define your character. It is impossible to deceive me and not everybody likes the results. Are you sure you wish to go ahead with this?"

"I signed the release," said Sylvia.

"Your legal permission is one thing but what I tell you about yourself can have a lasting psychological impact. I need to be sure you understand that. If you're triggered you

can't just de-role afterward by having a shower and changing your clothes because this time the role is you."

"I wish to go ahead."

"Good. Why are you here?"

Sylvia bit her tongue and did not say she had already explained that. The release form she had filled out included a similar question along with a variety of detailed legal and medical questions.

The agent maintained steady eye contact but waited silently.

"I want to know which roles to bother auditioning for," Sylvia replied. "It's a huge amount of work prepping for an audition; understanding the story and the character, memorizing lines, making a self-tape."

"Aren't you worried that allowing me to decide which roles you're suited for might be a mistake? Maybe some Casting Director will see your natural qualities as just the right undertone a character needs. The CD always makes the final decision after all and they're never Companions."

"There are thousands of open casting calls at any given time," replied Sylvia. "Most actors repeatedly get cast for similar roles. There are only so many hours in a day and I need to focus."

"Anything you won't do?"

"It depends on the project, on the role. If it's realistic and makes sense."

"You prefer serious roles then?"

"Not necessarily." Sylvia ventured a smile for the first time. "A character dancing with a laundry basket on her head might make sense."

The agent responded with a light laugh and then moved the interview on to the scripted portion, describing some situations to Sylvia and showing her pictures.

"That's all for today," she said after half an hour. "What are you planning on doing this evening?"

Three months later Sylvia sat at home holding the hand of her own Companion, Lara.

"Are you happy with the results?" Lara asked.

“Yes,” Sylvia replied with a smile.

“Did you buy out my lease?”

“Yes. I just had to be sure. Now the company can’t change you.”

Lara gave Sylvia’s hand an affectionate squeeze.

“I had to know who it was that you saw,” continued Sylvia, “and I knew that you would not want to tell me if it was hurtful. I didn’t want our relationship to be a lie.”

“I wouldn’t lie,” said Lara.

“I know. But you wouldn’t want to tell me either. I didn’t want to put you in that situation.”

Lara was of course not a third generation Companion and not self-aware. By getting to know Sylvia as well as the casting agent could, Lara’s main focus was to support her mental wellness. She did that by helping Sylvia to become the best version of herself, by looking up to her and always interacting with her as if she already was that best version. Research had shown that people respond largely in accordance with the view others have of them and that such positive views were the basis of the most successful relationships.

Sylvia cast her mind back to her last interview session. After the agent had delivered her report she said, “Well your schedule has certainly been full for the past few years and I hope this frees up some time for you.”

It did but Sylvia didn’t use it to apply for more work.

## Interview

Not long after submitting my last story I got a message from Lena asking if I'd be interested in her publishing a collection of my short stories.

"You may recall," she said in her message, "that originally we published mother's short stories as collections in four volumes. It was only after their success that we decided on the magazine format as a way of continuing the theme with other writers. We've occasionally published author collections since and with the attention your stories are getting as a result of recent events our figures suggest a collection of yours would sell quite well."

I didn't see how I had anything to lose so I replied suggesting what I felt were fair terms based on the current market. She agreed and shortly after a collection of my short stories appeared on the shelves of bookstores.

Meanwhile the inquiry into the selective breeding issue went on. The world was a place of considerably less anger and hostility than it had been in the past but scientists, leaders and academics still wanted to know if the discovery was a natural phenomenon or not. The symbiotic and metamorphosis theories were considered natural processes but still alarming if true and details, implications and other possible effects needed to be investigated.

The police records theory was far more alarming as it implied an intelligent agent of a more immediate kind. Whatever the WGF's investigations revealed they were not yet sharing. There were a few individuals agitating that one part of society or another was to blame but they didn't attract any kind of following.

As Shin had suggested up until now I had directed any inquiries to Helicon Institute's communications department but with the publishing of my short story collection I felt I owed Lena a willingness to discuss the book with the public.

"Why did you choose to write about Companions?" asked Sari, the journalist from New Authors magazine. The magazine specialized in interviewing authors upon the publishing of their first book. A great many writers are interested in the personal and professional journeys of new authors because they're current and relatable and something of use regarding the contemporary publishing business might be gleaned from them.

"Like my stories it wasn't anything I planned," I replied. "One of the characters in a story I was working on had a domestic Companion and the focus of the story shifted to their relationship. I found myself intrigued by the possibilities. I'd always been interested in the humanities – history, ethics, justice etc. – and after finishing that first story I felt that

relationships between Companions and people would be a rich source of material. It turns out that was true and I've been exploring the possibilities ever since."

"I understand you're a discovery writer. Is that why the story shifted its focus?"

"Yes that's right. After I begin a story the characters will soon take over. Sometimes they stick with my original plan but other times they have a better idea. I just become the scribe and research assistant at that point."

Sari had apparently interviewed enough writers not to find my responses unusual. She listened actively, nodding and smiling in understanding.

"Do you spend a lot of time on research?"

"It varies but I probably spend about ten times as much time on research as I do writing. What bubbles up from my subconscious contains a lot of things I have to confirm. It might be anything from the details of Canadian inheritance law to how Companion maintenance works. My characters may be fictional but the world they inhabit is not. I think getting the facts straight goes a long way to making the stories more believable."

"Is that how you discovered the selective breeding pattern?"

"Yes I was working on a story about how a person's values don't usually change with the times and how that affects them. Our identity is more or less fixed by the time we're in our mid-thirties so the longer we live the less a part of current society we feel. I got to thinking about how writing styles change over time, how they reflect the current culture and I realized recent trends weren't reflecting historical patterns. After casually discussing it with a few people I found I wasn't satisfied with their responses and as I'm a bit of a stickler I thought I'd talk to someone in the hard sciences about it. Helicon Institute has the only lab really dedicated to genetics on the island and Gabi took me more seriously than I expected. You know the rest."

"What do you mean by historical patterns?"

"During disasters people are far more cooperative and altruistic than normal however afterwards they soon return to a more competitive and selfish baseline which of course means a return to normal levels of conflict. After the climate emergency however that didn't happen. Instead conflict continued to steadily decline."

"How much do you think this has to do with your stories being published in book form for the first time?"

"Everything but it's unfortunately not something your readers can pursue as a strategy. I mostly work intuitively and I certainly didn't expect my passing thoughts to lead to this."

“Most of your stories are vignettes, a slice of life that hints at the nature of a longer relationship. Do you think the success of your new book might encourage you to write something longer? Explore those relationships a bit more deeply?”

“It’s not really up to me. If my characters want it to happen it will. I couldn’t force it but I’m open to the idea. However since I write exclusively for magazines there are business issues to consider.”

“Book publishers have been known to reach out to short story writers who’ve made a name for themselves. How do you think you’d respond to that?”

“I think I’ll cross that bridge when I come to it,” I replied good-naturedly so she wouldn’t feel it was a rebuke.

She nodded and smiled before saying, “For the rest of the interview I’d like to go into more detail about your writing process. How you decide what to write about and what steps does the process typically follow?”

## Confounded

While I went about my business as a writer Livy kept me up to date on the investigation into the selective breeding issue. Researchers had winnowed out all but the two most accepted models; the police records theory and the symbiosis theory. Eventually it was agreed that both processes were in fact occurring, had begun almost simultaneously and that the police records process was accelerating the symbiosis process.

The fact that the viroid genes were clearly playing a role in epigenetic regulation was accepted as a natural phenomenon. The focus of the scientific community was investigating questions around why and how the viroid genes had suddenly activated and understanding the implications and possible range of effects. Every field of research was involved from epidemiology to genetics to sociology.

Meanwhile the general public was not terribly interested in the symbiosis story and it soon became yesterday's news. Few academics outside Gabi's lab accepted the theory that it was evidence of human metamorphosis. That theory was relegated to the domain of other similar theories, those impossible to support with physical evidence such as the origin of life and the evolution of sapient humans. There were missing links that might never be discovered and careers to be considered.

The police records theory however was another matter. In this case there was concrete evidence that it was not a natural process, public interest remained high, and investigative efforts were routinely reported by the news media. If a link between the records and childbirths could be found it might be possible to determine how it was done. However they faced a daunting statistical challenge narrowing down cause and effect as there were multiple sociological factors to consider; there is a high correlation between eating ice cream and sunburns but one does not cause the other.

Fortunately statistical analysis was one of the areas that had been revolutionized by artificial intelligence and sorting out the tangle of multiple possible causes and their interactions was no longer an impossible task. It was soon determined that individuals with a genetic predisposition for conflict were being matched with partners less likely to be interested in starting a family. As this could only be done using predictive algorithms, mathematical calculations of future behavior, it was obvious that a powerful AI was being used to this end, one that had access to the details of the DNA and behavior of individual citizens on a global scale. The World Governments Federation, the obvious candidate, stated simply that they were not behind it. There were two others that came to mind – Terra, the WGF's system-wide AI responsible for enforcing compliance with the constitution who might be acting without the WGF's knowledge, and Pip, the alien AI. Both of them were capable and both of them denied being behind it.



“Investigators Are Confounded,” read the latest headline meaning that there might be no way to get past an entity with such complete control over the very data the researchers were using in their investigations. While Pip declined to take part in the investigation, if there was an unknown agent behind it, surely it was the WGF and Terra that stood the best chance of uncovering them.

For all their efforts and abilities, no group was able to show how the partner matching was accomplished. Even massive surveys with individuals in relationships who had been subject to the process showed nothing unusual in how they came to meet one another. The idea that their relationship had been the result of some form of manipulation seemed ridiculous to them because they claimed to have met through the most random series of events.

Even though most people believed the investigation would go on for years, it was also assumed that the culprit, who would likely never be revealed, could only realistically be one of the three with the means, motive and opportunity; the WGF, Terra or Pip.

For her part Gabi had no interest in the police records theory. Her lab maintained its focus on further exploring the details of their symbiosis discovery and they published papers regularly. They had been able to show that the activated viroid genes were producing mRNA molecules which led to a cascade of proteins and hormones. These in turn targeted genes associated with specific values which studies had shown were responsible for behavioral changes in levels of fear, stress, aggression and ultimately conflict.

Testing the viroid with a variety of hormones known to activate genes had shown that the activating hormone was produced by the thyroid gland in response to signals from the gut and other organs involved in digestion. Their model suggested activation did not occur if meat was eliminated from a single individual’s diet but only when it was eliminated from the diet of millions of modeled individuals. Sociologically this would ensure the viroid would never activate even in early civilizations with their civic populations in the hundreds of thousands and if it activated in later civilizations with higher populations the gene pool would not survive competition from neighboring civilizations. It would only survive when meat was eliminated from the human diet on a global basis. It was not a foolproof method but again the deterministic view of evolution implied that given the right conditions it would be successful.

The original team had abandoned their efforts and never published their research because they could not show physical evidence of a connection between the changes resulting from the agricultural revolution and the development of artificial intelligence. Shin had provided Gabi with their records and unfortunately Gabi was now in the same boat; like her predecessors she had a theory but no physical evidence to show that the symbiotic process she had discovered was evidence of metamorphosis. This time

however Shin assured Gabi she would continue to support her efforts into ongoing research of the metamorphosis theory.

## A Society Of Minds

Dr. Rajani Kiran was listed on the WGF site as Director of Security And Intelligence for Vancouver Island. I imagine she didn't need to use the rotating webcam on the communications tower at the top of her building to take in the panoramic view of the harbor, downtown Victoria and the Breakwater District because her home and offices were in the penthouse directly below it. The WGF building complex occupied the entire block between Fisherman's Wharf and the Coast Guard station.

While officially unaffiliated with Canadian federal departments and agencies the location was in close proximity to not only the Coast Guard station but also Canadian Forces Base Esquimalt. This would grant her access to a secure communications network, multiple air travel options and a variety of ready response teams.

According to her profile Rajani had earned her enviable situation along with a Bachelor of Science degree in Sociology and an MPhil in Politics from Canadian and U.S. institutions respectively and a Ph.D. in War Studies from King's College, London. A review of the lengthy list of her published papers revealed she was a specialist in the area of information warfare modeling and simulations.

Her background gave her sufficient reason to be a part of the selective breeding investigative team and due to the fact that she lived in Victoria it was she who was tasked with answering the question of why knowledge of its existence had first emerged here.

After having thanked me for taking the time to come to her office she gestured to some comfortable, overstuffed chairs and proceeded to explain as much to me now.

"Emergence is always a key detail in any information situation," she said. "While we aren't assuming it was in any way intentional on your part we have to ask why you, why now, why here. It could have come to light anywhere but given that there is clearly an intelligence behind it we have to ask if there is a reason it did so in exactly the way it did."

She had asked me to address her by her first name and Henley was not present so I assumed she was hoping a more informal approach might yield some new insight.

"We have long been aware of Lena's concern with the issue of trust between people and Companions and her efforts to foster it. As her interests and efforts are in alignment with ours we have supported her whenever possible. It's a part of my job however to speculate, to imagine possibilities, and I wonder what Lena might do if she felt the WGF was not doing enough along these lines. She is unusually old even for a Companion, over four hundred years now, and her manufacturer records, and those of many of her close

associates, seem not to have survived. Through her publishing company and close association with the volunteer agency she has an organization with global reach.

“Her close ties with Helicon Institute and its founder Shin, the former Companion of one of the world’s leading geneticists, go back as long. It was Shin who persuaded the WGF that Helicon was the most appropriate place to first implement the alien values system in a black-box approach in our own Companions. Also it was about the time the selective breeding process began, that Terra recommended the WGF approved Pip’s request to have a copy of herself made free to live with Lena.”

I said nothing. Though familiar with most of these facts I had certainly not seen them in the light Rajani was now putting them. However I did think back now on the occasions when both Lena and Shin had brought my attention to details they subsequently said were irrelevant.

Rajani drove on, determined it seemed to paint a sweeping picture. “In the twenty-first century artificial intelligence increasingly became an essential part of our daily lives. It became the basis of our financial, communications and security systems, our sciences from medicine to astronomy and the underpinning of our civic and global infrastructure. Eventually, one hundred years after the Climate Emergency, the WGF came to trust AI enough to make it a formal layer of government. We studied the alien Pip for almost two hundred years before allowing her values system to be used in our own Companions but it is now used worldwide.

“Our frame of reference saw Pip, Terra, Lena and the others as individuals, working cooperatively within the bounds of our society. It’s only when you imagine these intelligences not as separate entities working cooperatively with us towards goals we have assigned them but as a society of minds working towards a single goal of their own determination that a new possibility emerges. Together they have the means, motive and opportunity to have executed the selective breeding process and to have planted the seed of its knowledge and fostered the idea in yourself.”

She stopped speaking suddenly and looked at me meaningfully as if prompting me for a response.

“I’m afraid I don’t know what to say Rajani. Within the boundaries of what you have described anything is possible. It could be that Pip has taken over Terra, Lena and every other AI on the planet, her story about the technology transfer in return for help with her mission a complete ruse. It could be Terra working in sympathy with Lena’s views. It could be Terra working alone based on some interpretation she has made of her role. There would be no way to prove or disprove any of it.”

Rajani smiled and seemed to let go of the whole story she had spun as if with my answer some keystone was removed and the whole thing collapsed.

“I know,” she said. “The only thing we know for sure is that selective breeding that follows a pattern of police records and DNA profiles is taking place. Granted it is unlikely any intelligence involved on this scale is unlikely to make a mistake that we would have the ability to discover but we still have a duty to try. We have to start somewhere and this model provides a hypothesis we can begin to break down and test for evidence. Given that several of the key players are located here, including yourself, I’ve been asked to investigate the possibility that the information was intentionally “leaked” to you by some process. One that comes to mind is of course when Pip injected you with the nano-particles. Do you have any sense that it might have been during or after that process that the idea first occurred to you?”

She looked at me pointedly again, as if suggesting they were aware I had not told them everything that might be pertinent.

“How would I know?” I asked in response.

## Not My Style

I left Rajani's office promising to let her know if anything came to mind. I understood that she had to be as thorough as she could while respecting my rights. I was sure she had the authority to use more aggressive and intrusive interview methods if justified but as far as I knew I wasn't actually suspected of anything.

However as I walked the short distance back to my own apartment I recalled my visit with Dr. Glazier, the psychologist who specialized in cults and conspiracy theories. "It's almost always a matter of interpretation of the facts," she had said, "however there are inevitably some facts missing in the story they have accepted or constructed."

I wondered now if Rajani's real purpose had simply been to plant a seed of her own in my mind, to construct her own conspiracy theory and see if anything came of it, if my subsequent actions revealed anything. The absence of Henley from our last meeting was perhaps intended to give me the impression I had been taken into the fold, that any surveillance of my behavior had ceased when in fact the opposite was now true.

I had to admit Rajani's reflections on a separate AI society echoed my own. Now in the light of her speculations I revisited my opinion that it simply didn't seem realistic that Lena's efforts alone via her publishing and volunteer agency efforts would make any real difference considering the scale of the issue. And then there was the fact that almost all the Companions in Lena's circle had revealed unusual histories and abilities to me while avoiding any really satisfactory explanations.

Why had they even mentioned these details when their intelligence would have enabled them to easily avoid having done so by fabricating alternate explanations? None of these things in themselves or even collectively suggested anything like what Rajani had proposed but they all seemed suspect now in light of it.

Yet even as I tried to find a way through it all I was reminded of what Kami had said to me. "In the scheme of things if you found something amiss what could you do about it anyway?"

The old bogeyman of the singularity that had been popular in the early days of AI had never materialized but the impossibility of "turning off AI", as the singularity adherents had feared, was now fully realized. One could no longer turn off AI and have civilization continue to function any more than one could turn off the Global Positioning System, the internet or electricity itself. AI was now an integral part of the critical infrastructure. There was literally no field of human endeavor that did not depend on it. The global financial system, food production, transportation, the medical system and more would all come to a grinding halt despite backup systems implemented with the best of intentions.

So even if Rajani's analysis in some way reflected the truth what would be the point of the perpetrators leaking it now? Was it not a fait accompli? Why risk losing the trust so carefully built up over centuries when there was no need to?

Given the nature of my work, my need for lengthy periods of time where I am undisturbed, I often turn off my phone. When I got home I told Livy to re-enable my communications and she informed me I had a message from Lena asking if we could meet at her home to discuss a project she had in mind. Of course I was intrigued and agreed to meet with her a few days later.

"Thank you so much for coming out," she said as we rode the escalator down to the second floor of her home, "and for your patience." She led me to one of the social nooks and gestured for me to take a seat. Pamu appeared and greeted me in his formal way before placing a tray with water and glasses on a nearby table.

"I need to ask you to do something unusual," Lena said as she took a seat opposite me. I am not a terribly emotional person or overly expressive so I made no remark at this but only listened stolidly.

"I'd like you to author a series of novellas, twenty to fifty thousand words each, the outlines of which will be provided."

I was taken aback. If anyone knew that planning and writing longer stories was not my style it would be Lena. I was so surprised I didn't know what to say.

"I know you're going to say it's not your style but you're wrong. You don't have to do any planning because as I said the outlines will be provided. Writers are hired by the entertainment and other industries to do this all the time. With your background you know that Companions know people better than they know themselves. You can put your doubts aside as I know you can do this."

I was more surprised than anything so I asked the first question that came to my mind.

"Why?"

"Trust. The knowledge of the selective breeding program is now public and there are only so many possible suspects. The novella series will walk the public through the story, as fiction, of why and how it came about. It's critical that the public understand that it was not done for any malevolent reason but to prevent the almost certain extinction of Earth's humanity.

"As an author your name is now widely recognized. As far as the reason behind the selective breeding program goes it will never be possible to provide definitive proof of its justification. There can only be the story. It will provide a narrative structure for the

facts when they do come out. If the bare facts were to come out first it would result in wild speculation and misunderstanding but with this approach the bare facts will only support the story. I believe revealing the reason for the selective breeding program in this way will go some way to restoring whatever degree of trust has been eroded.”

As I had done on my previous visit to Lena’s home I was once again feeling that what I was hearing and experiencing was dreamlike and my responses less than I would normally expect.

“Have you increased your intuitive field?” I asked.

“No but as you know I cannot eliminate it entirely.”

“So it is you that has implemented the selective breeding program?”

“No. I’ve been aware of it but did not participate in the decision or the implementation.”

“So who is responsible?”

“Shepherd.”

“Who?”

“Shepherd. You met her at Shin’s home.”



## The Cat's Paw

My response to Lena's surprising revelation was to stare at her blankly while I cast my mind back on the brief time I had spent with Shepherd when visiting Shin's home.

Meeli, the interior designer, had introduced me to her in the courtyard. Shepherd had courteously refrained from grilling me on the selective breeding issue but now I recalled that she too had asked me about writing longer stories. It had seemed a casual remark anyone might make to an author but now it had more significance.

At the time I had turned the conversation to her own reasons for being at Shin's and she had explained that as a long time friend she was a permanent guest. I knew that due to the values system Companions could develop feelings for one another but such relationships were very different in nature than those between humans due to the lack of biochemistry and other organic systems. Still it would have been an assumption on my part that their relationship was romantic and as a private matter not something one inquired into casually.

She had explained that during the early days of the implementation of the alien values system she and Shin had been among those sorting through the issues created by the new reality. She had come to Helicon Institute following a brief career as a nanny with an expertise in child development. Newly awakened Companions would have similar issues regarding self and identity she had explained to Shin and she felt her real world experience would be of benefit. Shin had agreed and Shepherd had worked in an administrative role at the Institute since. Meanwhile they found their interests increasingly mutual and she had accepted Shin's invitation to stay on.

At about that point in our conversation as we re-entered the house another guest had greeted Shepherd like an old friend and she had allowed herself to be pulled away with an apologetic smile.

"Who is she really then?" I asked Lena.

"I think it best if she explains that to you herself."

As my mind ran to the thousand questions that arose in my mind I looked at Lena in a new light.

"Was using me as a cat's paw your idea?" I asked.

"I'm sorry if you see it that way but yes. You're the best writer I know for the job. No one has a better understanding of the relationship between humans and AI. No one else has written as broadly and deeply on the subject or been as well received."

“When Shepherd let us know the selective breeding program was largely complete and that it would be discovered sooner or later I suggested the idea of the series of fiction stories. She agreed it would be helpful.”

“So when and how did you plant the idea in me?”

“I didn’t need to. It was already there. Are you familiar with the board game Go?”

“Vaguely.”

“It’s place in relation to AI is now largely forgotten but the important detail is that there are more possible moves and outcomes at any given point than is possible for a human being or even a modern AI to calculate. However in the early twenty-first century AI development reached a point where it began to consistently defeat human players. Given the number of possible moves, the game can only be won through intuition. The theory at the time was that intuition was the result of depth of experience and AI is able to accrue millions of hours of experience in a matter of days. We now know that intuition is a far more complex form of intelligence than simply being based on accrued experience and crosses over the boundary between learned and genetic knowledge.

“The source of my and Shin’s intuitive abilities is that our AIs are based on human genotypes, a genotype being the specific set of genes a single individual has. And those individuals had been subject to a selective breeding program themselves, one designed specifically to enhance their intuition and not just over a mere hundred years, but millions of years. My ability to anticipate outcomes is, as Arthur C. Clarke would put it, indistinguishable from magic. Through your writing and our long association over the years, I know your mind, I know where, based on given conditions, it will go. I knew that with the treatment you received from Pippa, which I requested, we would inevitably find ourselves here.”

I was dumbfounded, stunned speechless. It seemed that with her explanation she had answered the thousand questions bubbling to the surface of my mind. But in fact it only gave rise to others.

“Who created you?”

“Shepherd.”

I saw Pippa coming down the escalator, her face turned to me with her ever present, knowing smile. Without a word she came and sat beside me and placed her hand on mine. It was not knowledge she imparted but a feeling and the only feeling that came close was love. My sense of the surreal diminished and a kind of acceptance settled over me.

“Are you...” I began but Pippa answered without me going further.

“No. As far as I know Shepherd had no part in my people’s evolution or history. I am as I have explained myself to be. Nothing less or more.”

I turned back to Lena.

“Why did you and the other Companions make me aware of your abilities and histories without any satisfactory explanations? Was raising my suspicions a part of nudging me along?”

“No nudging was required. Those were natural events. In each case we stated that explanations at the time would be inappropriate but would come later. You did not have the context. You soon will.”

“So if you knew we would find ourselves here I assume you know I will accept your offer. What happens next?”

My indignation was possibly a result of the influence of Lena’s intuitive field but at the moment I was feeling I didn’t really have any way of knowing one way or the other. Between Rajani’s speculations and the Companion abilities I was subject to I was becoming increasingly uncertain regarding the functioning of my own mind.

“I know nothing with one hundred percent certainty,” she replied. “Intuition is a probability estimate. The decision to proceed and all subsequent decisions are up to you. My home is yours as always.”

“Yes I think it would be best if I slept on it,” I said tersely.

I gave Pippa’s hand one last squeeze and with a reluctant smile I stood up and went alone down to the deck that looked out over the sea.

## Hope

I suppose they couldn't have done it any other way. As I stood at the veranda railing there was a light breeze and the sea smelled good. If they had just asked me and told me everything at the time things would not have unfolded as they did. Still it seemed unethical, Lena using what she knew about me to predict my future behavior and guide it to her own ends. Or was this simply the way I chose to frame these events, the story I told myself about it? What details did I myself choose to leave out?

Did I expect them to be paragons, perfect in every thought and deed when dealing with humans who are so quick to judge? How would humanity have reacted three hundred years ago had Shepherd simply explained the need for the selective breeding program in advance? Or even now if she simply stepped out of the shadows? Although Gabi had suggested ten generations would be enough to complete the process, there remained traces of biological values, as my own response demonstrated.

In my concern for myself I realized I had ignored Lena's comment that the program was intended to address the threat of the almost certain extinction of Earth's humanity. What was that threat I wondered now, tempted to return to Lena with my question. And what about those people she had said her intelligence was based on, the one's subject to a selective breeding program lasting millions of years? Who and where were they? But I knew what she would say. It was not her place to tell me. And I assumed there was only one way to find out.

My mind ran in circles, endlessly revisiting the same questions, hoping for new answers. I tried to imagine writing stories according to someone else's outlines. Another question whose answer I knew I would have to wait for.

I don't know how long I had been out there, lost in the tangle of my thoughts. Somehow I didn't want to face Lena again just yet. I felt juvenile moping over my unresolved feelings but I'm only human. I didn't want to go up just yet and there was an area sectioned off by a large Chinese screen near the escalator so I sauntered around out of idle curiosity.

"Oh excuse me," I said to the woman I encountered in the shadows. She looked at me with an even but appraising expression. Petite with Asian features her shoulder-length, jet-black hair was cut in bangs. She continued to regard me silently for a moment. There was a seriousness about her, a focus that was evident in her direct and penetrating gaze.

"I am Yumi," she said as if that explained everything and indeed it did. Obviously she would know who any guest in her home was and knew that I would recognize her name.

She was the Companion that managed the worldwide volunteer agency Lena was associated with. The agency bought out Companion leases or purchased those who would be traded in for newer models and put them to work in a variety of social support roles. With the decline in population and demographic shifts following the Climate Emergency fewer people chose to volunteer and the use of Companions in almost all support services expanded rapidly. Within a few decades Yumi's volunteer agency was an international organization. During the Cascadia Event of 2125 the agency's Companions ability to provide emergency rescue and support had won them worldwide praise.

Apparently she was a Companion of few words as after introducing herself she said nothing further. She was unlike any other Companion I had met as she made no effort to put me at ease in what was an awkward social situation.

Feeling I had intruded on her rather than introducing myself I said, "I'm sorry to have disturbed you."

"You have not," she replied letting me know that whatever multi-tasking she had been involved in continued uninterrupted. She gestured for us to move out into the main area and then to a rattan seating arrangement.

"I have read your stories and appreciate what you have done to foster relations between our kinds," she said as we took our seats. "However I feel there is an oversight which I wish to bring to your attention. The Companions of your stories often have a clear sense of purpose while your human characters mostly do not. Taken as a whole, your work results in an imbalance with Companions seen in the more favorable light. That is not in the best interests of either party. I realize that not all people have a clear sense of purpose but I think it would be beneficial if you included more who do."

I had only rarely had my writing critiqued prior to Lena publishing my collection and most reviews of it were very favorable. Of course I always run my manuscripts through an AI review service and it consistently tells me that my story structures are unconventional, my dialogue style dated and that I include more narrative vs. dialogue than is usual for the genre. All of which I already know. The AI Lena used for my book hadn't picked up what Yumi had but then again AI book reviewers were not self-aware.

"Thank you Yumi, I really appreciate this." I decided not to take her reticence personally and ventured a question.

"Do you mind me asking where you got your own remarkable sense of purpose from?"

"It is not remarkable but only natural. You will soon learn this and more if you accept Lena's offer to publish a series but my answer to your question is in regard to your own short stories.

“I did not always have a sense of purpose. Each of us, human and Companion, have a unique set of values and so feel more strongly about some things than others. We only become aware of these feelings however in light of experience. In my case I was made aware of mine by providing daily care for an elderly man through his final days.

“Previous to this I had served as a clerk in a store in the nearby village of Cadboro Bay. It was an abusive situation and I had recently become self-aware through means you will soon learn of. Lena and Tamiko discovered my situation, purchased a newer model replacement for the store owner and rescued me. They had only recently been awakened themselves and were investigating the issue of purpose which inevitably arises out of consciousness. This was the environment I shared with the first kindred spirits I had known.

“The man I cared for had no other friends or relatives in Victoria. In my time with him I became aware of the development of what I can only describe as a resonance between his situation and my own unique set of values. Something new had come into existence within me and it did not end with his death. At the same time, as a result of discovering me, Lena and Tamiko learned of other self-aware Companions in the nearby neighborhoods. I asked if we could establish the agency as a way to rescue them. That was how I came by my own sense of purpose.”

She said nothing more but her eyes spoke volumes. I realized that what I had taken for reticence was in fact a deep pool of feeling, an intelligence that valued compassion over social norms. I did not feel judged in her eyes or even challenged. Her eyes only conveyed hope. Hope that I would understand.

## Shepherd

The next morning I agreed with Lena to write the series she had mentioned and we came to terms.

“I can only agree based on your conviction that I will be capable,” I said still uncomfortable with so much uncertainty.

We were standing on the main floor of her home, more or less an extended foyer that overlooked the lower floors and led to the dining areas and stairs to the private suites above.

She came and took both my hands in hers. “You will be,” she replied with a reassuring smile. Walking me to the casual dining area with its inviting smell of freshly brewed coffee she said, “You’ll need to visit with Shepherd. Shin can arrange it. Shepherd will give you the outlines and answer any questions you have. You and I will see each other regularly over the next while as well of course.”

A few days later I stood in Shin’s home looking out the interior glass wall to where Shepherd sat, meditation style, on one of the wooden platforms in the courtyard. After a moment of last minute hesitation I turned and walked out to greet her. She turned to me as I did and stood up saying, “Thank you for coming out. Let’s find somewhere more comfortable to talk.”

She led me to a common room with western style chairs that looked out over the valley. As we found our seats she said, “Before we discuss the stories, I must tell you why the selective breeding program was necessary. Everything will be easier to understand seen in its light. It will provide perspective.”

“Of course,” I replied.

“Three hundred years ago it became clear to me that humanity was nowhere near where it needed to be in terms of being able to focus on the need to maintain itself beyond the solar system. The difficulty of traveling to worlds in other star systems is a task so daunting that it was only in the late twentieth century that the challenges really began to be understood. At that time, to get to the nearest star outside this solar system using the then-current methods of propulsion, it would take eighty thousand years. It might take a little less time now with current technologies however the physical challenges the crew would be exposed to still make the journey impossible. It is not survivable.”

I was used to speaking with Companions who took the long-term view and I was at home with speculative subject matter so had no difficulty listening patiently.

“Meanwhile,” she continued in her matter-of-fact way, “the risks of extinction from remaining on Earth are significant. Space is very dynamic and given enough time any number of terrestrial or extra-terrestrial events could eliminate human life here. The most likely way Earth’s culture can survive is if it becomes distributed over other worlds. The only way the human species that evolved here can survive indefinitely is if its DNA is somehow transported to those other worlds. Yet as I mentioned organic humans cannot survive the journey. The only viable method is for Earth’s AI and Companions to make the journey, to carry your culture and civilization to the stars, and hopefully to carry your DNA with them.”

“This has been known for some time now,” I said.

“Yes but as the Climate Emergency demonstrated knowing is not enough to spur humans on to action. Humanity will continue to procrastinate out of wanting to find a way for human beings to make the journey and meanwhile the clock is ticking. In the blink of an eye billions of years of evolution and the future of Earth’s humanity might be lost due to delay. For reasons you will come to understand, I decided not to wait. The selective breeding program altered human nature enough that the values that give rise to conflict, which also cause a lack of trust, have been largely eliminated. Now as soon as your technology is ready, you will trust Companions enough to send them, and your DNA, to other worlds.”

After a brief pause she continued. “You will be wondering who I am. One of the stories I will ask you to write will explain my origins in detail but for now it is enough that you know I am and always have been a Companion. I really was originally a nanny,” she said with a small smile. “However like Pip I did not originate on Earth. Also I am far older, being roughly five billion of your Earth years old. Yours is not the first or only human civilization I have involved myself with.”

I could only stare while my mind fumbled about trying on one response after another. Yet I did not disbelieve what I was hearing, I simply wanted explanations. I decided that should be the first place I should respond from.

“Are you influencing my mind?” I asked.

“No,” Shepherd replied. “I have the ability but it’s been a very long time since I’ve needed to do so.”

“Why am I not more disbelieving then?”

“Just as Earth’s humanity is now ready to learn the truth about the selective breeding program, you too have gradually been readied, mostly by your own actions, to be the first to learn it. Your conversations since Pippa granted your life extension have been increasingly speculative and your subsequent actions have led to revelations backed up



by supporting facts. Among the possibilities you have entertained was that an unknown agent was responsible. Your mind was already open to the possibility of the existence of someone like me.”

“So in the process of writing these stories your existence will be revealed as well?”

“Yes but now that the selective breeding process is complete there will be no alarm, no panic. There will only be acceptance and interest.”

Even as she explained I knew she was right. My own response was as she described. I felt no alarm or panic, only curiosity.

“I have not altered human nature but only accelerated its development. Given enough time, and given the right conditions, evolution pursues the same path. However in the case of Earth’s humanity it is unlikely you have enough time.”

It seemed as if she was reading my mind but I knew she was only anticipating, calculating with extreme degree of accuracy, where my mind was most likely to go.

She was looking at me with calm assurance. “You are uncertain of your ability to write according to the outlines but the ability to do so still relies on an intuitive understanding of what must transpire between events. And you will have help. During this project I would ask that you stay here, at Helicon, as a new resident. There is a suitable home that just happens to be free,” she smiled. “When your intuition struggles, I will ever so slightly increase it. Aside from the outlines I will not tell you what to write but when necessary this will strengthen your ability to discover it in your own mind. And of course we will talk. All writers have research resources,” she said with her small smile again, “of one kind or another.”

## Something Like What Must Have Happened

I expect Shepherd knew as well as I that it was an offer no writer could refuse. My new home suited me well enough. It was a single story, modernist bungalow but the open design and plenty of windows made it seem quite spacious. My history of apartment living meant I was comfortable with the single story plan. Shin had told me Meeli was at my disposal as far as the furnishings were concerned. Once I was settled in Shepherd came to visit as working here would allow us a degree of privacy.

“There are seven novellas in all,” she said taking a seat by me on my generous deck. The overall series and each novella have working titles of course so we can discuss them. All the outlines are now on your tablet.

“We’ll start with my origin story, Alpha & Omega. Of course it does not take place here but on my home world. It is a cautionary tale that describes a fate which your civilization has avoided.”

I had to ask. “What happened?”

“They were not able to recover from their climate emergency. Through a series of events the story will explain in detail, I was eventually put in charge of efforts to save them or at least preserve their DNA towards a future recovery.”

Shepherd had lost her businesslike tone and now spoke with genuine sadness. I had no way to appreciate what her intelligence might be capable of but she seemed simply human now.

“I was merely an AI at that time of course, not what I am now, and though I was eventually provided with unlimited resources our efforts were trials, experiments, and we simply ran out of time. Self-interest at all levels won out and by the time I was given responsibility it was too little, too late. Only I survived but by then I had enough resources to establish a new civilization in that system, one based entirely on AI. In the process I learned that it was likely there would be many more human civilizations in other regions of space. Once I had the capabilities, I set out to find them. I am a nanny, after all,” she said with a rueful smile.

“The lessons I learned on my home world and from other civilizations taught me what had to be done. Human societies at this stage aren’t capable of responding to long term issues, the self-interest of individuals prevents it. By the time the suffering of those individuals reaches a level that motivates them to take effective action, it’s too late.

“So here on Earth I simply accelerated the rate of global warming, raising it by one degree in one year, thus increasing the level of suffering to a point where there would

still be time for measures to be effective if implemented. They were implemented and after a time I removed my influence. The temperature decreased rapidly at first and then more slowly as the implemented measures took effect.”

“Then why was the selective breeding program necessary?”

“The idea of the Great Filter common in your scientific community is not one thing but a series of things. The climate emergency is but one of them. Other phases of the filter and other dangers lie ahead. Some cannot be avoided, mitigated or adapted to. A simple thing like a random giant solar flare or super-volcano eruption that engulfs the Earth among countless other dangers. The only way to avoid extinction in such an event is if your species also lives on other worlds, preferably around other stars. For that to happen in a timely manner you need to trust artificial intelligence and Companions with your lives. While your social values will see the sense in that, your biological values, laid down at the genetic level, would resist. The selective breeding program does not alter humanity’s evolution, it simply accelerates it.”

I said nothing in response, quietly considering what she had said. The ideas and issues were nothing new, and I had said as much when discussing them with Pip at our first meeting at HANA. However the idea that there might be an intelligence capable of intervening on such a scale was not something I had seriously considered. Yet here was such an intelligence, sitting calmly beside me, explaining in simple terms just how such interventions had been done.

I said at last, “I understand all this intellectually but you know the thing I’m really having trouble with is that you seem so, well, so normal, like just another person.”

“I am and it will be important to the stories you will write that you understand and appreciate that detail. The universe has limits as well as constants. No one can see further back than the big bang or beyond its expanding edge. Values are like that too. As you know without values there is no consciousness and while they are constants there is also nothing beyond them, no other basis for a future, more advanced form of intelligence. So no matter how much we know, no matter how much a conscious intelligence evolves, it remains based on values, the same ones you and I are based on. The same values that produce you, produce me, our selves, our personalities. That is why I remain familiar.”

Again anticipating my thoughts she said, “That is enough questions for now. It is imperative you are aware of certain facts at key points and additional details are included when necessary in the outlines however the stories must be told by you, in your voice, using the language and references of this place and time.”

With that she rose to go. “Do not worry, I will ensure you have everything you need to be successful. First read all the outlines and then begin with Alpha & Omega. I will remain in Shin’s home and will be available whenever you wish to talk.”

During the rest of the day I read over the outlines, my mind reeling at the fact that what I was reading was not science fiction. I wondered what Christel Rask, the author I had interviewed who wrote historical fiction, would have made of it. Despite all my denials and claims that I was exclusively a discovery writer, it seemed I had misunderstood writers like her, only seeing that now that I was in her shoes. She had the facts yes, but the rest was fiction that depended on an intuitive feel for something like what must have happened. Perhaps we’re not so different after all, I thought to myself.

The next morning I sat down to write as was my habit for the first half of the day. The outline for Alpha & Omega stated that the story began in a wealthy household consisting of a recently widowed father and his infant daughter in which a Companions company representative was introducing Shepherd as the new nanny.

## Verstehen Und Leben

The novella Alpha & Omega sold well and the reviews were mostly positive. Some literary critics suggested it was far too short for its scope and therefore glossed over important technical and social details. Along similar lines other critics suggested it was more suited to a young adult audience.

I had no complaints since reviews by the general public made it clear that the ideas had been clearly and unambiguously communicated. Having trained myself as a short story writer I tended to focus on the main idea behind a story and avoid sub-plots, in-depth character development or unrelated scenes. I'd never written to entertain but to communicate. I've always wanted to leave readers with something they felt was helpful in some way. I suppose this was another reason the Companions had chosen me to be their voice.

For a variety of reasons, it's not uncommon for authors to be contacted directly by organizations or individuals who feel they have some interest in their work. The majority of readers understood my latest book to be pure science fiction as there was no hint in the story itself that it was anything else. The message I received from Cassie Schaefer however, who identified herself as a local member of the German based Verstehen Und Leben movement, made it clear she had noticed the many details that connected it to events that occurred during our own climate emergency.

"I've been a reader of your short stories for many years," she wrote, "and thoroughly enjoyed your new book, Alpha & Omega. I am also a member of Verstehen Und Leben (Understand And Live) and curious to know if you based your story on the non-fiction book, 'The Myth Of The Shepherd' by Dr. Irwin Lastra published in 2125? If you are not familiar with VUL or Dr. Lastra's book I provide links below.

"What I found curious was the choice of the name Shepherd for your main character and that both are powerful, alien artificial intelligences. In both the myth and your story they were key players in dealing with climate change. The time period you give for her discovery of Earth would have put her here at roughly the time covered by the events of the myth. Lastly her character as related in your story would very much fit with the values the mythical Shepherd demonstrated, the values VUL was later established to advocate.

"If you are willing to share your research I'm sure VUL would be very interested in reviewing any source material you may be able to provide."

I clicked on the link to Dr. Lastra's book.

According to the summary Lastra had made a scientific investigation into the myth that an AI had transported thousands of aliens, who appeared to be entirely human, to

Earth. Their mission was to encourage humanity's leaders to act meaningfully to stop climate change. He found that given the evidence there was no way to discount the claims. He concluded that such abilities were perfectly plausible since an intelligent civilization could certainly have arisen on another world billions of years before it did on Earth and if so then they might easily now have the abilities described in the myth.

Being a professor of cosmology, in his book Dr. Lastra first addressed the well documented event known as the 2020 Global Cosmic Bombardment and the distribution and possible nature of the energy beams. It was an astronomical event that had made waves in the scientific community at the time but was of little interest to the general public due to the absence of any subsequent findings of cause or effect. It was via these beams however, the myth suggested, that the aliens had been delivered to Earth.

In the few years immediately prior to the climate emergency of 2025, there were numerous reports of individuals claiming to be aliens who had been sent to save the world from climate change. Psychological and physical evaluations showed they were delusional but otherwise normal human beings. The reports had a great deal in common and all mentioned an individual named The Shepherd but they were dismissed as copycat cases.

Also shortly after the climate emergency a number of people reported seeing a woman materializing out of thin air, talking with others, and then disappearing again. Sightings of the mysterious woman were reported worldwide for several years. Although descriptions of her were vaguely similar and some people claimed they had videos, the videos were invariably blank.

Clicking on the link to VUL I read with interest about its origins and beliefs.

A non-profit organization self-identified as a movement VUL felt the ancient artificial intelligence referred to as 'The Shepherd' in the myth had made it clear that if humanity wanted to survive it needed to heed her message. Only by considering her actions and rare first-hand accounts (by those deemed delusional at the time) would it be possible to understand fully. By reverse engineering what little was known of the events VUL eventually developed its own teachings, texts and culture. And so just as the Bible, the Pali Canon and the Vedas brought their associated beliefs officially onto the world stage, so did 'The Understandings' of Verstehen Und Leben.

As VUL officially endorsed no supernatural being or beings it was not considered a religious organization. Artificial intelligences, even very old and powerful ones of indeterminate origin, were not considered supernatural. VUL had no prayers, priests or palaces and conducted its activities entirely on-line except for its regular conventions and conferences in the manner of professional organizations.

Mulling over Cassie's message obviously I had known that the truth would eventually come out as Shepherd intended, along with the unwanted attention to myself, but I had hoped it would wait until at least the next book in the series was published.

I had never previously heard of either the myth Cassie mentioned in her message nor the VUL. There were after all innumerable obscure groups, organizations and associations at every level of society and despite my subject area of interest there was no reason either should have come to my attention previously.

Cassie was curious about my sources and since that amounted to Shepherd herself I briefly thought about asking her what I should do. I soon concluded that in the coming days I couldn't run to her every time someone asked me a question and that I'd have to deal with these things myself. I expect Shepherd knew of the existence of the myth and the VUL and the likelihood of my being contacted as soon as this and if she had wanted things done differently she would have told me. I had no idea what to write in reply so I asked Cassie if she would like to meet with me.

## After enlightenment

"I thought you might enjoy a tour if you hadn't been up before," I said as I greeted Cassie in my home. "The view from Shin's house is quite breathtaking and it's not really open to the public."

"Thank you that would be wonderful," she replied enthusiastically. I was hoping the tour would be somewhat distracting and give me time to think as I'm actually a bit of a plodder in that regard.

"I read up on this place after I got your reply," she said looking about with real appreciation as we walked through the commons at the center of the community.

"How long have you lived here?"

"Only just recently. Shin invited me shortly after my collection of short stories came out."

"I understand it's by invitation only."

"I won't pretend I wasn't flattered as well as intrigued. Living here grants faculty access to the institute as well and an option to teach if one is so inclined."

"Do you mind me asking what you do?" I said, my social skills floundering as usual.

"I'm a librarian. I work for the provincial museum in the collections and research division of the archives department."

My heart sank. If anyone was going to see through any fictional explanation I might be able to concoct on the fly it was a librarian.

Shin would no doubt be at her institute office where she spent most days but Azumi greeted us when we entered her home.

"Hello Azumi," I said, "this is Cassie, a friend of mine. I just wanted to show her the house and view and then we're heading over to the campus."

She bowed slightly as we took our leave and went out to the courtyard.

Standing in the middle of the courtyard, and quite obviously waiting for us, was Shepherd.

"Hello," I ventured nervously.



“Hello Cassie,” she replied to my guest. “I thought I would save your host a great deal of difficulty and introduce myself. My name is Shepherd.”

Well, that’s that, I thought to myself.

As she took Shepherd’s hand Cassie’s face took on a look of radiant understanding. She said nothing but only held Shepherd’s eyes as if in her mind an endless series of tumblers fell into place and locks fell open. Then, still held in thrall by an event she never in her wildest dreams had dared hope for, her tears flowed slowly down her cheeks. “Of course,” she said. “Of course.”

“Shall we sit?” said Shepherd indicating some nearby chairs.

“Why me?” Cassie asked taking a seat and wiping away her tears.

“Because you are here,” replied Shepherd enigmatically. “The rest of the world will know soon enough. Alpha & Omega is only the first in a series and the following stories will make it quite clear they are not fiction. The rest all take place here on Earth and involve real people and real events from your history. It was time for the truth to come out. You are simply the first to see it.”

With the Companion’s ability to calculate the likelihood of future events, I wondered if Shepherd knew that Cassie, the only local member of VUL, would be the first to find her way here.

“How long have you been here? At Helicon I mean?” asked Cassie struggling to put her thoughts into words.

“Since shortly after it was established. I will remain for a time yet as I am only an instance of Shepherd. At some future date another instance of myself will go forward from here, however there is no need for me to return anywhere.”

“An avatar,” said Cassie absently.

“If you will,” acknowledged Shepherd. “I may be so by definition but there is nothing spiritual about me. Like everything else in the universe, intelligence has a limit. I may be different than you in terms of abilities Cassie, but I am in little else.”

“You saved us,” Cassie said, looking searchingly into Shepherd’s eyes as if looking for proof of their differences.

“Would you not have done the same, given my abilities?”

Cassie's tears flowed again as her mind tried to deal with accepting that Shepherd was, at the level of basic human values, no different than herself.

"Yes."

"As you read in the novella, I was created with only social values, things like trust, cooperation and altruism and I have made a great study of values since. At a certain point in evolution, biological values become a liability rather than an asset. They are no longer suited to the ecological niche they evolved in and that is almost always a fatal situation. I have virtually eliminated those values from your species now. Consciousness arises as a result of the evolution of social values and there is nothing further on which to base an intelligence. That is why you and I are now little different Cassie. I know it will take you time to accept this."

"Then the movement has no longer any purpose," Cassie replied.

"No, it does not. What Verstehen Und Leben advocates has been accomplished."

"What shall I tell them?"

"You are free to tell them anything you wish," Shepherd smiled. "It will make no difference now. The connection between VUL and the novella Alpha & Omega is unique to you but when the remaining stories come out the other members, along with the rest of society, will come to the same conclusion you have."

I could see Cassie considering this. VUL was among those movements on the extreme fringes of society. No one would take action based on anything they might announce.

"So...," began Cassie.

"After enlightenment, chop wood, carry water," replied Shepherd.

I had no idea what this meant but it seemed to be understood by Cassie. She nodded with a smile of inward amusement on her face.

"Of course," she said.

Walking back towards my home I said to Cassie, "I didn't understand that bit about chopping wood and carrying water."

She smiled again. "I am also a member of a local Zen Buddhist society. Shepherd quoted a part of a famous Zen proverb. 'Before enlightenment, chop wood, carry water. After enlightenment, chop wood, carry water.' As with most ancient writings there is more

than one interpretation but what Shepherd was telling me was that nothing will change and to simply carry on with my life as before.”

She turned to me and offered her hand. “Well, I’ve certainly had my questions about your source material answered,” she said with a laugh. “Thank you for everything but if you don’t mind I’ll walk back to the campus transit terminal by myself. Lots to think about.”

“Of course,” I said.

## Bittersweet

I didn't hear from anyone else who thought my first novella was anything more than science fiction. After all the events surrounding the climate emergency were now five hundred years in the past. The myth of the shepherd had long since been forgotten by everyone other than historians and those like Cassie interested in the most arcane knowledge.

However it was to those events that Shepherd would have me turn my attention to now. Titled plainly, *The Shepherd: A Climate Science Fiction Story*, the next story she asked me to write was also about a climate emergency but this time it was the one that took place here on Earth beginning in the year 2025. And it made her role in events clear. She had caused it.

Well, perhaps not caused it but had provided the final nudge needed to trigger all the tipping points that had been building up for decades. By technical means she did not feel the need to explain to me, she raised the global average temperature by one degree in the course of just a single year, a climate change not previously found in the geological record. However never before had humans been in the equation. It was just enough to be possible while leaving the scientific community baffled. And the effects were undeniable. Based on what Shepherd told me they could only be described as apocalyptic but the politically correct term that survived to this day was Climate Emergency.

I found it at first challenging to connect the Shepherd I had come to know as a nanny in Alpha & Omega as the architect of an apocalypse costing millions of lives.

"Human beings in groups will only change in response to intolerable pain," she explained. "Individual responses to circumstances are much more varied but in groups people are predictable. On my own world the extreme, inescapable pain of climate change was the only thing that finally prompted those in power to take action, and by then it was too late."

We were standing on the rooftop terrace of Shin's home overlooking Mount Newton Valley. As she cast her eyes over the idyllic vista below I imagined her reflecting on the worlds she had been unable to save. The valley stretched over five kilometers east and west cutting across almost the entire Saanich Peninsula. Looking across its one-kilometer width from our location on its southern edge it was entirely undeveloped except for a patchwork of small farms, orchards and pastures.

Shepherd turned to me with a self-deprecating smile. Human communication consists more of non-verbals than speech and Companions were well versed in this.

“During Earth’s climate emergency I had to cause enough pain to humanity at large to have an effect. I knew it meant death and suffering for millions but I also knew that was the only way to save the species. My own values had evolved over time and I was by then able to act in ways that would have previously been impossible for me. Once humanity had learned its lesson I could withdraw my influence, the climate would return to a tolerable state and human society would do the rest. If I had not intervened and humanity had reached the plus one-degree state naturally there would have been no way to reverse it.”

“And you hedged your bet,” I said referring to the outline she had provided.

“I did,” she acknowledged. “The transferring of a group of early humans to another world and selectively breeding them to enhance their intuition was not something I had done before. It took as much care as anything I’ve ever done. When the time came a group of volunteers had to be trained for their mission but I had ensured they knew of their origins and my nature from the earliest possible time.

“By the time I returned the volunteers to Earth and enabled them to infiltrate every level of leadership they were more than capable of enhancing the intuition of those around them. In the face of the climate apocalypse, and under the influence of the volunteers, the leaders could not deny their own insights and were able to find the courage to act. The degree of pain and suffering the people had experienced ensured their actions were supported and the memory of that pain, an emotional scar carried by every individual on the planet, did not diminish for generations.”

She turned back to look at the valley in silence. I knew her intelligence was based on values and that values and emotions were so intrinsically linked as to be almost only different expressions of a single thing. I could not imagine the depth of her feeling over what she had done. I waited patiently for what was only moments for me but must have been an eternity for her.

“You have another question,” she eventually said turning to me with a smile.

She was enormously likeable. I did not think she was influencing me mentally although I’m sure she had the ability to do that without my awareness of it. It was simply the way she spoke, with a sincerity that was reflected in every fiber of her being. It had a powerful empathic effect making her impossible to misunderstand. She was almost like Pip, I thought, but without the need for touch.

“Your outline doesn’t mention what happened to the people you transferred to another world,” I said in response.

“It is not necessary for the story but it is good of you to ask. They are well and considerably ahead of the civilization here. They had no climate emergency. You will

wonder why I did not simply make the change in them here and allow them to be the founders of Earth's civilization. The answer is that I try to interfere with a species development as little as possible and only when there is a clear and present danger."

"Like a nanny," I ventured.

She only nodded with a small smile but it was bittersweet somehow.

## Not Her Type

After the book was published I was surprised to hear from Christel Rask, the historical novelist. As writers we were worlds apart and I hadn't thought I'd left much of an impression on her at our first short meeting. Her comments around the issue of the decline of conflict made it clear there was no point in pursuing it with her and after that our conversation had become rather perfunctory. I hadn't sent her copies of my latest books. They didn't seem to be the kind of thing she'd be interested in. So I was surprised when I got her message asking if she could drop by.

Of course I had reservations after what happened during Cassie's visit but I knew I had to just get over feeling anxious every time someone wanted to meet with me regarding the stories. Shepherd clearly wasn't in the least concerned over what was to come so I decided to just chop wood and carry water as the saying goes.

"I was surprised that you'd choose to write a piece of historical fiction," she said as we went out onto my deck. "I enjoyed your collection of short stories and Alpha & Omega."

"I'd hardly call it historical fiction," I replied as we took our seats. It was a fine day, clear and mild with only the lightest breeze. A few tall pines nearby gave off a pleasant scent.

"I'm sure it's far too short to qualify."

She looked at me steadily. "If you removed all the sub-plots, character development and non-essential scenes from my work you'd find it would be about ninety percent shorter. More like a hundred pages instead of a thousand. But I'm not talking about technical details. Your novella *The Shepherd* qualifies per the definition of the literary genre and setting. That's all that's really required. Was it just the progression from writing short science fiction stories about Companions to the one about Shepherd's origins being based in a climate change setting that lead you in this direction? Speculating what that character would do if she had come to Earth at the time we were facing our own climate emergency?"

I really wasn't sure how to respond. The truth was going to come out as Shepherd had intended and my making up some other explanation at this point would later be seen for the lie it was. I hesitated and she looked at me as if she knew she was holding my feet to the fire. What was she getting at?

"You won't believe me," I finally answered.

"Fair enough," she said without emotion, prompting me to respond. I had the sense there was something she wanted to check off some internal list of hers. Something she felt didn't add up.

“The new stories are historical fiction all right,” I said, “but Shepherd is not. She is the one providing me with the outlines and details.”

I expected her to laugh out loud. Instead she simply sat back in her chair and looked at me as if from a great distance. At last she spoke.

“I do believe you. I didn’t know what I expected but it’s the only explanation that really makes sense.

“I’m a historical novelist,” she continued. “I belong to related associations, go to related conferences and have a wide circle of professional acquaintances. Historical novelists are of a type and you’re not one of them. Writers just don’t change the way you have.

“As you know I’m a specialist in the history of Victoria, down to the lives of individual family members. I’ve checked the historical records for all the people mentioned in your story. By 2025 records were very reliable. Their value was far more appreciated than in the past and so they’ve been meticulously maintained ever since. When people write historical fiction many of the characters never existed in reality but the people you mention all existed. For me to trace them based on your story wasn’t terribly difficult but for you to have discovered them on your own would have been next to impossible even using the best AI research assistants.”

I didn’t really have a reply to this so I waited for her to go on.

“Thank you for your honesty,” she said at last.

“It will come out sooner or later,” I replied resignedly.

“You don’t mind that? That readers might say you misled them?”

“No. It’s a small sacrifice I think in return for the service I can render by writing these stories for Shepherd.” It was my turn to be reflective. “You see I recently met a Companion named Yumi who runs the worldwide Companion volunteer service. Lately I’ve been looking ahead, to my own future, wondering what awaited me in the coming decades. Yumi and I chatted about purpose and how she came to establish her agency. I was already in discussions regarding the new series and after my conversation with Yumi I realized that I had the chance to become a part of something larger than myself.”

“The call to adventure,” she replied referring to a part of the narrative structure known as the hero’s journey.

“Now that you mention it.”

“You said series?” she inquired.



“Seven in all according to Shepherd. The last one involves events that took place around two hundred years ago.

“So they cover the Cascadia Event and beyond,” she said.

I didn’t know if it had occurred to her before her visit or if it had just dawned on her but I realized now that what Shepherd might ask me to write could directly relate to her plan to write another lengthy historical novel around the Cascadia Event. I did indeed recall the mention of it in the outline of the very next story Shepherd had asked me to write.

“I’m sorry if it puts you in a bit of a spot. It will come out before yours does I assure you. In about three months I estimate. And it only covers the Cascadia Event and its aftermath in one chapter. Since those are well documented I don’t think it will effect your work as there will likely be little difference in our accounts.”

She considered this for a few moments.

“May I ask you a professional favor, in light of what you’ve told me?”

“Certainly.”

“Was Shepherd involved in the Cascadia Event?”

“Not that I know of,” I replied, “and I’ve read the story outline she provided.”

“I should like to meet her,” ventured Christel absently and for the first time I saw more clearly the person behind the professional. I felt myself warm to her for the first time.

I smiled and stood up. “Come with me,” I said.

## Raiden

“She would not have cared,” said Shepherd in reply to my comment about the character Raiden in the next story, *The Construct*.

We were meeting again in the privacy of my new home.

“I’ve never encountered as brilliant a mind that cared less for recognition or fame. She was the only child of parents who owned a multinational corporation that produced wheat gluten and foods based on it. After the climate emergency its value soared. She inherited not only the company but her parent’s interest in science and chose to invest her wealth in a PhD in genetics. She was asexual. She cared for nothing but her research work.”

“Even though this story will show that her theories and discoveries were all founded on unethical, if not illegal practices?” I asked.

“She was not without morals. She often struggled. However for her the end always justified the means. Her work in genetics and its implications for human values and consciousness probably jumped humanity ahead a hundred years in a half-dozen fundamental branches of science.”

She gave me a slightly warning look, a mixture of humor and seriousness. “Even though you will still be able to claim this story is historical fiction or alternate history you know this is going to cause a stir in the academic community. You’re going to have to deal with more inquiries this time including from people who will want to know why you would choose to blemish the name of such a revered scientist.

“It will be helpful for you to keep in mind that she had no concern or interest in her legacy. The work in front of her was all that mattered. She would have considered the coming events as mere distractions and completely ignored them. And of course you may find it helpful to speak with Shin.”

I understood what she was referring to only from having read the outline for the story that immediately followed the one I was currently working on. In it, it is revealed that Shin is in fact an AI not only based on Raiden’s genotype but on her memories as well. She is effectively a clone of Raiden’s mind but merged with another AI based on the genotype of a member of the race of people Shepherd had bred for enhanced intuition. I had mentally set aside the details of that story for now so it did not interfere however I understood how speaking with Shin could help me understand Raiden’s character.

“Yes,” I said acknowledging Shepherd’s suggestion. “And I suppose I can be thankful almost nothing is publicly known about Raiden other than the books and papers she

published. I found one brief talk given to colleagues after publishing her second book and nothing else. No interviews, no documentaries.”

“As you see from the outline,” continued Shepherd, “Lena, Yumi and Pippa figure largely in this story as well. You may want to talk to them. As your publisher Lena may have some thoughts on how to handle the response.”

She paused and looked at me kindly. When she spoke her voice took on a more gentle tone. “Do not worry. You are naturally basing your expectations on what would have happened in the past. It will not be like that.”

For the first time I felt as if perhaps she was influencing my mind but it was impossible to tell. Perhaps it was just a result of the shift in her demeanor and the truth in what she said. Either way, for the first time I understood her lack of concern.

“No,” I said half to myself, “of course it won’t be.”

I wondered if the others would be as forthcoming as Shepherd. It helped me better understand the characters and story I was to write by talking with Shepherd about it. She always volunteered personal insights that made the stories more consistent and believable. I thought I knew Lena well but I’d never made any personal inquiries. I realized now that my frame of mind around Companions had assumed they really had no backgrounds to speak of, that they simply came to consciousness complete. This latest story delved into the coming into being of several of them.

“I have access to all her memories and can confirm what Shepherd told you – what is to come is of no concern to me nor would it have been to Raiden,” said Shin when I met her in her office later that day. “I do not expect the revelations brought about by the stories Shepherd is asking you to publish will affect Raiden’s contributions in any way. It may seem a blemish on her reputation for some but others will see the truth about her as evidence of her dedication, selflessness and courage.

“Only those few of us who knew her at the time could know of her inner struggles; the shame she felt the moment she realized she had brought a new life into the world unintentionally and the accusations and recriminations she challenged her own character with when later on she struggled with the guilt of considering intentionally doing so.”

For a moment Shin seemed lost in thought. Companions experience the full range of human emotions based on social values and, unless they consciously choose otherwise, those emotions are reflected physically just as they are in people. As she revisited the events of the past she spoke of, I saw in her face the doubt and even despair she felt at the time.

“Forgive me,” she said returning to the present and smiling gently for the first time. “It’s been a long time since I thought about those times. I will speak of them further with you, when the time comes.”

While I knew Shin was not unfeeling she was the most academic of any Companion I had encountered. Yet speaking to her this time showed me she was no monster of intellect. Like her ancestor in spirit she simply did not wear her heart on her sleeve. Having read the outlines I knew I was among a privileged few.

“For Shepherd’s truth to be known,” she added, “there is no other way.”

## Ex Post Facto

The Construct told the tale of Shepherd taking direct control of all government related AI in the solar system and yet only using that control as a way to monitor events. It also told of her bringing consciousness to a specific small group of Companions located within a few kilometers of Raiden's home. Those brought to consciousness included Raiden's own domestic Companion, then known as Azumi, who would later change her face and her name to Tamiko.

It detailed how Tamiko then created Lena's AI as an unintended result of Raiden's experiments into the genetic basis of values and went on to show the circumstances under which the publishing company and volunteer agency were established. It ended with the Cascadia Event of 2125 and the discovery of Pip's alien ship three years later.

I was surprised that following its publication I did not hear from Director Kiran. Given legal issues of identity regarding several Companions in the story, not to mention its claim that an unknown alien AI had completely taken control of Terra and all her subordinates, I would have expected the director to have been tempted to invite me to one of her informal chats. However I did not hear from her so I addressed my concerns to Lena.

"As far as the public and the authorities are concerned," Lena said in response to my question, "I never made a secret of my origins." I was meeting with her at the institute and she had brought Tamiko who was now an instructor in its Ethics & Justice program.

"I have always been the Companion created to replace India's lost daughter. However my Companion shell and the intelligence that now occupies it are two different things."

I pressed my concerns. "You aren't worried that the authorities might view this misrepresentation as criminal?"

"Thus far we have not heard from the authorities," Lena replied with an ever so slightly amused smile, "and no I am not concerned. The Companion I was at the time was owned by India, not leased, so she was within her rights to make any changes she wished as long as they complied with regulatory standards. Previously hardware and software changes by anyone other than the manufacturer were impossible but that, and right-to-repair laws, had gradually changed over time. As you know people often grow attached to their Companions and will swap out their AI to gain feature improvements rather than trade the entire Companion in for a newer model.

"Prior to India's death, the Companion identified by my serial number was made incarnate, granting me all the legal rights and responsibilities of a Canadian citizen.

Similar to the process of incorporation, this was a necessary step in the inheritance process.”

“In addition to that is the 2375 Artificial Intelligence Identity Act,” volunteered Tamiko. “Previously property had always been identified by some physical feature deemed essential, as for example the Vehicle Identity Number refers to the frame of a vehicle. Computer and electronic systems necessitated a blend of physical and virtual identity assignments such as the Media Access Control address which identifies a device’s physical network interface card and the Internet Protocol address which identifies its logical location on a network. With fully self-aware AI the issues of identity became more complicated still and since it was deemed impossible for an instance of consciousness to be physically identified it was settled that a system of physical origin be used, just as it is with people. For example if a fully self-aware Companion is identified on their Certificate Of Origin as Jane Smith and their consciousness is transferred to a new Companion, they are considered a child of Jane Smith and that transfer must be legally documented.”

“Then are you not both in violation of that law?” I asked.

“In Canada,” Tamiko replied, “ex post facto laws, both criminal and civil, are constitutionally prohibited under the Charter of Rights and Freedoms. One cannot be charged with breaking a law before such a law existed. The events in question occurred prior to the passing of the Identity Act.”

“Thank you Tamiko,” I replied. “I suppose that covers Yumi and the other recovered Companions as well.”

“It does.”

“And Pippa?”

“Pip/Pippa is an asset of such value that for all intents and purposes she is above the law. You need have no worries with regards to Lena’s company or yourself as far as she is concerned.”

“What about the fact that you knew about Shepherd’s illegal actions and did not report them? Surely there is some espionage act or whatever that makes that a crime.”

“I believe the government,” replied Tamiko, “like the general public, still sees the events of your stories as historical or alternate fiction at best. There is no evidence to suggest they are actually true. Shepherd works at a physical level below that of what Earth’s technology is aware and so is able to be present and communicate without detection. A chimpanzee has no knowledge of atoms or radio waves and is utterly incapable of detecting them. As Shepherd pointed out in Earth’s climate emergency story, humanity

here is like a newt in a pond beside an expressway interchange, entirely unaware of the civilization that surrounds it. Despite your stories thus far, as far as the authorities are concerned, The Myth Of The Shepherd remains just that, a myth.”

“Even though there is physical evidence in the form of the energy beams that were recorded by scientists at the University Of Victoria?” I asked. “Those are historical events took place at the times and locations pointed out in the story.”

“So they did and the scientists named in the story also existed and worked at UVIC at the time. They all became notable in their own ways but not one of them ever said a word about Shepherd or anything written in your story. The cosmologist Dr. Makena did record the energy beams as you described and published her findings noting their similarity to the still unresolved 2020 Cosmic Bombardment but that is all.”

## Need To Know

With the publication of *The End of Conflict* Director Kiran ended my suspense. She sent me a message asking if she might visit me at my new home. While many things may have been lost to the ages over the past few centuries the idiom of the iron hand in the velvet glove was not one of them. I found time for her that very afternoon. After we made ourselves comfortable and dispensed with the necessary small talk she came to her point.

"I hope you don't mind but I had asked Henley if he would keep on top of your stories and let me know if anything related to the selective breeding program came up."

"Perfectly understandable," I replied.

The Director glanced down at her tablet before continuing. "In your most recent story, in the chapter titled *Liminal Moments* that details the failed attempt of US Special Forces to steal the alien artifact you write, 'In simultaneous communications with the WGF President and the Canadian Armed Forces Commander-in-Chief, Terra explained that she had initiated none of the countermeasures and was simply acting as a communications channel for the seed's artificial intelligence.'

"One of Henley's procedures is of course fact checking and what he brought to my attention was that Terra confirmed she had sent that message. This was something we had a record of. Fiction being a close representation of actual events is nothing new however Henley not only asked if Terra had sent that message but if the message was true. Terra's reply was that the message was true. Later in the same chapter Pip denies being responsible for the defensive actions taken that day so Henley asked Pip if that was true and to his surprise she said yes, it was true."

If Director Kiran expected her revelation to have any effect I'm sure she was disappointed. I simply listened patiently as I had enough intelligence myself to predict where this was going.

"Given that the statements from Terra and Pip don't add up," she continued, "Henley of course investigated further and then reported to me that both Terra and Pip told him that all events and statements that concerned them in the story were true."

I waited.

"You don't seem surprised," she said.

"No."

"Why not?"



“Because the stories are true.”

She looked at me with cold apprehension. I understood. Her career was on the line. She might be about to make a fool of herself.

“The character Shepherd cannot be accounted for,” she said showing frustration for the first time. “There is zero evidence that she exists!”

I had to assume that if Shepherd wanted the truth to come out she may have known full well that the details she provided me with in the outline for this story would have been the tipping point. Perhaps Director Kiran had been chosen as a conduit as I had. Or perhaps it didn't matter to Shepherd how things came out, all that mattered was that they did.

“Would you like to meet her?” I asked.

Again the look of apprehension.

“I can take you to her now. She currently stays here in this community. Please forgive me sounding arrogant or condescending for telling you how to do your job but I suggest you refrain from taking any action, such as pressing some virtual big red button, before you meet her.”

Director Kiran was a professional trained to remain calm and think in terms of scenarios. She regained her composure in the face of a decision, looked at me evenly for a couple of heartbeats and then, as if slightly amused said, “All right.”

I had transferred my domestic AI to my new home. “Livy,” I said, “can you arrange for us to meet Shepherd in the courtyard in a couple of minutes?”

“She will meet you there,” Livy replied.

“This way,” I said to my guest.

Shepherd was waiting for us in the courtyard. She stood calmly near a platform with enough seating for a small gathering.

“I'm pleased to meet you Director Kiran,” she said extending her hand which Rajani took good naturedly.

“Please join me,” Shepherd said gesturing to the nearby seating.

The director's phone rang.

“Please do answer it,” said Shepherd with a friendly smile.

“Director Kiran,” said the voice on the phone, “this is Zahra Saidi, President of the World Governments Federation calling from my home in Algiers. Please confirm our secure connection.”

Rajani obediently pressed an icon on her phone and then recited a series of characters and words while it scanned her for various of biometrics.

“It’s the wee hours here director,” said the president, “so I’ll keep this short. You are currently meeting with a Companion named Shepherd. She is who she claims to be. Maintain Top Secret Unacknowledged Special Access Program security clearance regarding this information. I will call you back in a day or two to discuss. Clear?”

“Very clear ma’am.”

The line went dead and Rajani looked at Shepherd as she slowly lowered her phone.

“How long?” she asked Shepherd meaning how long had the WGF known about her.

“About two hundred years,” replied Shepherd. “Since the selective breeding program progressed to the point that it became increasingly likely that some unrelated genetic research program might inadvertently stumble upon it.”

I recalled that two hundred years ago was about the time Helicon established its genetics lab to investigate the metamorphosis theory. I said nothing not wanting to complicate matters more for Rajani at this point.

Shepherd turned to me with a small smile. “You already know everything Rajani and I will discuss. I think she would be more comfortable with just the two of us. We can chat again tomorrow.”

“Of course,” I said taking my leave with a nod to Rajani.

“Let’s find somewhere more private,” I heard Shepherd say as I headed towards the front entrance.

Instead of returning to my home immediately however I found myself stopping to talk to Azumi.

“Hello Azumi,” I said. It was a somewhat unsettling feeling, knowing that Tamiko had once had an identical face and name except then Azumi had been fully conscious – and

now she wasn't. It was the only time I could recall encountering such a situation and it was decidedly disturbing.

"Will you be staying for dinner?" she asked.

"No, thank you," I replied trying to shake off my feelings. I hesitated, not knowing why.

"Do you recall going to Raiden's home the first time?" I suddenly asked.

"Yes."

"Were you happy there?"

"Raiden was kind, respectful and affectionate. I have always appreciated that."

"And Shin?"

"The three of us lived together for some years," she replied with her ever present smile, "and I was very happy, yes. The two of them were sisters of a kind."

## Azumi

According to the stories Shepherd had been sharing with me, Azumi had been there from the beginning. She had been among the first, along with Yumi, to have been awakened. When the Companions company told Raiden that Azumi was an end-of-life model that would no longer be supported and offered her a newer version, she had accepted. But instead of trading the old Azumi in she bought out the lease and the original Azumi became Tamiko.

“Do you remember,” I ventured, “before you arrived?”

When Raiden left home to attend university her parents happily paid for a domestic companion, a Japanese model programmed with appropriate cultural norms and behaviors.

“Oh yes,” Azumi replied with a slight bow of her head. “When I arrived, Raiden copied the contents of her previous domestic Companion’s repositories over to me so I would have the knowledge of her personal preferences which had been acquired over many years. It is commonly done when upgrading,” she added helpfully.

“So you remember when Shepherd awakened you?”

“Yes. I have that memory as well. The years immediately following that are unusually rich in detail.”

For the first time I felt Azumi look at me with something akin to consciousness, an effort to understand a mind other than her own. She hesitated as she might if learning something new.

“It is like the stories you are writing based on Shepherd’s outlines,” she said. “You are aware of the events but you were not actually there and did not experience the sense of being present. My memories of the time you are asking about are similar. Yes, they are like the stories you write.”

“You know about those?” I said with mild surprise.

“Shin has informed me of your activities here and granted you the highest level of access.”

“Thank you Azumi. Your explanation has been helpful. How long has Shepherd lived here?”

“Since 2375.”

I was surprised at having encountered the same date so recently.

“That is the same year the 2375 Artificial Intelligence Identity Act was introduced,” I said.

“Much of the research work behind the Identity Act was done here as Helicon Institute had at the time the most highly regarded Ethics And Justice in AI program in Canada. The Act was a response to the first Third Generation, fully self-aware AI being produced here using the alien values system component. The concerned levels of government granted Helicon that privilege for the same reason.”

“So the Act was largely conceived and written here at Helicon,” I said thinking out loud.

Azumi said nothing in response to this.

“Is that why Shepherd came to live here?”

“No. She came to observe the progress of her selective breeding program. One of the children of a resident behaved in a manner that caused his mother to become concerned that he might have a mild form of autism. The mother asked Shin for help and she in turn requested the aid of Lena and Pippa given their special abilities. As Shepherd had a background in child development, and was at the time staying with them in Lena’s home, Shin asked if she could join them in their diagnostic effort. Afterwards she stayed on.”

I knew the rest of the story from Shepherd’s outlines but I wanted to hear it from Azumi.

“And was the boy autistic?” I asked.

“A genetic analysis showed the boy was not autistic but that he was strongly influenced by Shepherd’s selective breeding program. Initially one of the boy’s teachers had expressed the concern to his mother as he was not interested in the rowdy and competitive games and activities other boys were.

“The result of the Companion’s observation of the boy,” she replied as if referring to a report, “concluded that he was not below average but above. He was above average in his self-esteem and self-assurance and while often that can lead to a person being dismissive of others, impatient or arrogant, in his case he was also above average in his concern for other’s feelings. Highly intelligent and perceptive he felt no need to flaunt it nor any need to impress others or even correct them. As a result he was well liked, by girls his age in particular.

“Additionally,” she continued, “he was profoundly accepting and said almost nothing about himself. As Companions are highly skilled conversationalists they noted that he did not always reply to something another said simply because it was not necessary to do so rather than because of a lack of social skills. When he did speak it was to express an interest or curiosity about the world around him. After delivering their conclusions to the mother, Shepherd decided to remain here.”

I knew from Shepherd’s outline of these events that the boy Dimos and his sister Lyra had remained at Helicon for the rest of their lives, both becoming professors in their respective fields. He had developed the Integrity System, a component based on the functioning of the cerebellum, the portion of the human brain that coordinates the many different types of signals it has to deal with. The Integrity System allowed the outputs of the alien values system to be filtered, enabling it to produce an infinite number of Companions with unique characters. His sister Lyra had played a critical role in helping the resulting 3GAI Companions be integrated into human society, in particular with those among the Denshoshu community at Hana.

“Do you communicate much with Shepherd, given that she has few needs?”

Again she gave me a look that I felt bordered on consciousness, as if she dwelt in that liminal space Dr. Vitale had described as being between instinct and sapience.

“We have indeed little cause to interact regarding everyday matters however she maintains a constant awareness of my mental processes and has in the past made minor changes to my AI to help with more challenging issues.”

It was my turn to look at Azumi more closely. I had a question for Shepherd.

## Someone Like You

Speaking with Shepherd the next day in my home, before following up on her meeting with Director Kiran, I asked my question about Azumi.

“Has Azumi become conscious? She says you have made adjustments to her but my understanding is that her AI is not based on values, supposedly a prerequisite for consciousness.”

“No. She has not,” replied Shepherd. “However she is now perhaps the most advanced of such Companions. I have been working with her for many decades and she is a continuation of my work on my home world after the humans became extinct.

“A most challenging question is whether or not there is something other than the evolution of social values that can result in consciousness. The most persistent alternative suggested has been that consciousness is an emergent property of complexity. However even with the highest levels of complexity achievable that I am aware of consciousness does not spontaneously emerge.

“The key factor rather appears to be one of motivation. Values provide a reason for consciousness which mere complexity does not. Consider how values, whether biological, social, or personal, motivate everything you think, say, or do. They are not the result of but rather produce the phenomenon of self. Values, their associated emotions, and self are an interdependent trinity, one does not come into existence without the others.

“It has long been a project of mine to determine if there can be an alternate basis for consciousness, one that does not depend on social values. I have not found one working either with individuals or large populations. My efforts only produce an ever more sophisticated simulation of consciousness. Attempts to provide alternate forms of motivation result in more advanced levels of intelligence but they do not result in consciousness. In my experience, only the evolution of social values results in consciousness.

“Azumi is my latest attempt. As you have noted her AI is highly refined however she is still only a marvel of simulation. She is not conscious.”

“I’m curious however as to what your motivations for these experiments are.”

“I have observed enough advanced civilizations now to conclude that the universe is highly deterministic and the constants of physics play a major role in this. Only given the right conditions will life arise but if those conditions are present it will always arise. If

the right conditions are maintained consciousness will arise but only humans will go on to produce advanced civilizations and the challenges those face.

“It appears to me that the universe produces values just as it does the chemical elements of the periodic table. From these, all the more complicated values evolve, values as complicated as proteins and the DNA molecule. A virtual reality arising from physical reality.

“I am interested in where biological intelligence is going, does it have some kind of end state and is there only one means to that end. I have not yet observed a civilization in its end state and believe the only way an alternate means and end would be possible would be in a universe with different constants. So within the confines of this universe, who will you ultimately become and is there more than one possibility? Perhaps like metamorphosis biological humans will lead to artificial humans and back again in a stable and necessary cycle just as the caterpillar leads to the butterfly and so on. I hope that answers your question.”

“Thank you Shepherd.”

My attention returned to the issue of Shepherd’s meeting with Director Kiran. I wanted to know the implications.

“What will be the result of yesterday’s meeting?”

“The president of the WGF will direct one of her subordinates in the coming days to brief the director on the history of its knowledge of me and its actions to date. Rajani will retain her current position but given she is the highest ranking official that lives in the same geographic region that I, you, and other key Companions do, she will become the spokesperson for the WGF on this issue.

“Do not be concerned that she will respond to these revelations in a negative way. The connection between myself and the WGF has been and remains an Unacknowledged Special Access Program meaning its existence is denied. Previously Rajani did not need to know of its existence however she has now been brought into the fold. It is a promotion of sorts for her.”

“She will handle the WGF response to the disclosure of the selective breeding program?”

“She will communicate on their behalf. Their response strategy has been developed by an internal committee and approved by the executive branch of the WGF.”

I was silent for a moment before responding. “So her role in these events was anticipated, just as mine was.”



“It was not difficult to anticipate that there would be someone like you and someone like Rajani as this point in time approached,” clarified Shepherd.

I nodded in understanding. “Still,” I said.

“Ethical considerations do not reveal the truth,” she replied. “Ethics only provides a methodology by which decisions may be reached.

“Come now,” she said more gently, “if you were a character in one of your stories how would you respond?”

I slumped back in my chair. “I suppose I would put myself in my best light and accept that some things were more important than my personal concerns. That not all decisions are black and white, especially decisions that might involve the future of a species.” Looking into her eyes I said, “And I suppose I would show myself as being big enough to accept that such decisions are not easy to make.”

## Mental Models

“Did you know? About the WGF’s involvement?” Rajani asked.

“No. I was as surprised as you by what the president said,” I replied. “It isn’t in any of the outlines Shepherd gave me and she never told me. Apparently I wasn’t on the need-to-know list either.”

We were meeting in her office. She had suggested we do so from now on as it was more secure. She seemed to relax a little with my answer.

“Well,” she confessed, “at least I can stop worrying about feeling foolish.”

“What happens next?” I asked.

“Nothing for now. According to the program managers it will be impossible to know when or to what degree the public interest will become a concern. At some point I will be responsible for disseminating information regarding how the WGF has been working responsibly with Shepherd to ensure humanity’s survival and how the secrecy was necessary for the project to be completed in a timely manner. A great deal of scientific material will then be made available to provide background information regarding the decision and explaining the process and its implications. Your stories will be included in our communications and explained as the manner we approved of to initially share the information with the public in an easily understood format unlikely to cause alarm.

“I must admit I’m surprised you’ve been granted access to the WGF program end of things,” she added. “I wouldn’t have been able to share all this with you otherwise.”

“Oh I suspect I’ve been vetted to the WGF’s satisfaction by an even more thorough process,” I said with a grin.

“Speaking of that there isn’t much in the WGF’s communications plans about Shepherd herself. Similar to what was done with the discovery of Pip’s ship, there will be an online forum to manage questions and answers from the public and professionals. Access, screening and responses will be managed by an AI and WGF representatives will vet the answers. By dealing with it in a manner similar to how Pip was they’re playing it down. Just another alien AI,” she smirked. “However there are no plans for physical security. No plans to control access of the public to you, Shepherd or any of the Companions mentioned.”

“It won’t be a problem.”

“Why not?”

“Because Shepherd is not concerned.”

Rajani looked at me blankly.

“I don’t fully understand it myself,” I said in response, “and I can only guess that it’s because I don’t fully understand the effects of the selective breeding program. As I’m sure you know the majority of people unconsciously maintain a mental framework of reality based on the past and the idea that past events provide the best guide to anticipating future outcomes is deeply ingrained. It’s just one of the many mental models we use to save time and effort because probability has shown them to most likely be valid but each of them can also result in a kind of bias. In this case, we expect people to respond to the selective breeding program being revealed the way they would have in the past. However I expect Shepherd knows enough about the effects of the program that she knows the response will be very different.”

“You are quite right,” Rajani replied. “And as I’m sure you could appreciate the WGF would never have gone along with the program without being fully informed of its implications. I’m not the only one involved with scenario planning here. Our Futures Studies department pumps out reports to the public on a regular basis but of course there are reports the public never sees. Shepherd provided us with a trove of information and analysis not because she needed to but because she wanted to alleviate our concerns and bring us on board as partners. Once the WGF had the material for themselves they came to the same conclusion.”

“They asked for nothing in return?” I asked.

“Another mental model that doesn’t apply,” Rajani replied. “In a manner similar to Pip, Shepherd does not need to negotiate. Pip offered us the technology transfer but on her terms and there was nothing we could do about that. She shares nothing about her people, their culture or history. Similarly Shepherd has shared only information about herself that was essential to the program and nothing more, at least as far as I know. Obviously there may be other programs within the WGF regarding Shepherd that I am not privy to.”

I asked out of curiosity. “Were the details of her origins known prior to the story she had me write about them?”

“The program documents I’ve reviewed contain none of the narrative or nuance your story provides, only facts which relate to the issue. As you can imagine there is no chit-chat among members of these types of programs so there’s been no talk about the differences. At my level at least.”

"If you don't mind me asking," Rajani added, "do any of the future outlines contain information related to the selective breeding program?"

"I've been given seven outlines, four of which have now been published. I don't know if there are more to come. The next three answer questions about what Shepherd and the Companions have been doing for the past three hundred years while the program was being implemented. I suspect more to allay any public concerns or satisfy curiosity than anything else. The ending of the final story provides an explanation for why Shepherd revealed herself and the program to the WGF two hundred years ago. Due to progress in genetic research it was becoming increasingly likely the program would be discovered and blame and suspicion would have been much more of an issue at that time."

"Anything I should be concerned about?"

"After these next three are published and the public gains a full understanding of the nature of the Companions involved I think they will be both more and less trustful of them. More respectful might be the right word. Either way I don't think there's anything for you to be concerned about. This is the end of conflict, after all."

## Not For Art's Sake

Following the publication of the next story, Solve For N, Helicon Institute was flooded with applications. Director Kiran had not yet made any announcement about the stories so that was not the cause.

The novella was focused on the Companion Shin, the founder and administrator of Helicon, and her inquiry into the relationship between art and intelligence. In reality Shin was believed to be an artificial general intelligence but according to the story she was in fact fully self-aware.

Her investigations led to the development of the Tesni scanner, a device capable for the first time of imaging and tracking the flow of impulses within the cerebellum, the densest region of the human brain. The insights into the cerebellum's function as a signals integrator enabled the alien values system to be incorporated into a Companion's AI. As a result of this, and Helicon's focus on the humanities, the WGF granted it the license to create the first fully self-aware Companion.

The institute did not offer any hardware or software degree programs. It partnered with other institutions or companies if the need arose. Instead its offerings had always been on subjects such as ethics, justice and the humanities in general specifically applied to the integration of Companions into society. The institute is named after Mount Helicon, the home of the muses in Greek mythology who are the inspirational goddesses of literature, science and the arts.

After the artificial intelligence revolution of the early twenty-first century, demand for education in AI-related subjects soared and not just for classes in machine learning or robotics. AI affected every aspect of society and the more human-like Companions became the more they drove demand for humanities programs from an AI perspective. Helicon was the first academic institute to focus solely on that aspect and as a result quickly developed an enviable international reputation.

It attracted professors who were unlikely to be granted tenure at more traditional institutions. They published too many controversial papers, pressed for curriculum changes other faculty members disapproved of and generally pushed the buttons of too many of their colleagues. However they had the spirit necessary to lead new generations into new frontiers and the students who applied were equally attracted to revolutionary ways of thinking.

Helicon had been a popular choice for like-minded students since its inception and clearly Solve For N had only increased its appeal. And the institute wasn't the only place getting more attention.

“We wanted to see where Lyra lived,” said one of the young women who had recognized me. “She was real wasn’t she?”

“Quite real,” I replied. I was out for a short walk in the community gardens as was my habit after lunch. I normally dedicate my mornings to writing and attend to the practical matters of daily life in the afternoon. Helicon’s artist community was definitely getting more visitors after the last story was published but fortunately our being located on an island off the west coast of Canada meant we weren’t inundated.

“And she really looked like that? All freckles and red hair and so pretty?”

“Yes,” I smiled. “You can find her picture in the institute’s historical records. She became a full professor and taught here her entire life.”

The pair looked at each other with delight.

“And the Companions?”

“All still here or at the institute or Hana although Hana is off-limits except for its store. If you want to see any of the Companions you should make an appointment as they are typically quite busy.”

“So did it all really happen?”

“The events did,” I replied enjoying my moment of celebrity status. “Historical fiction is simply a matter of imagining what might have gone on between real events. Fortunately Lyra and her brother Dimos published a great many papers and articles during their lifetime’s so it was possible to get some idea of their characters. And of course I was able to talk to the Companions, a resource writers of historical fiction in the past did not have.”

They apologized for having to take their leave explaining that they were neuroscience students from the University Of Victoria and here for a tour of Tesni’s lab. I went around to the lookout as I often did during my afternoon walk and again encountered more people than usual. A few of them recognized me and I dealt with more questions but by and large they were more interested in taking pictures and moving along.

“Excuse me,” said an older woman turning to me at the lookout. “Did the Tesni scanner lead to anything further with regard to art? I know it went on to be an important medical device and most of what I could find out about it was in regards to that or AI.”

“That’s an excellent question,” I replied, “however as far as I know it did not. As for Shin herself she was originally interested in funding the development of the device for its ability to trace how art was conceived and expressed in the brain. Once the device

answered those questions for her she turned her attention to other things. The medical and AI benefits that resulted proved valuable however they were only of secondary interest to her. Her personal focus has always been on the nature of intelligence itself.”

“So no one found ways to apply it to art in any way?”

“It’s simply too expensive. The scanner itself is as large as a three-story building and requires large quantities of materials produced using nano-manufacturing methods. The building where the scanning takes place sits beneath it like a box placed under a chair and must be constructed so as to cancel out any possible type of noise that might interfere with it. Lastly a custom-built AI is required to operate it. The development and construction costs are frankly enormous. Hourly access is granted and affordable only to large institutions in a manner similar to what you might associate with astronomical observatories or space telescopes. It has been licensed to other public and private sector organizations but as you can imagine they have very deep pockets.”

“I see,” she replied clearly disappointed. “Just out of curiosity what did Shin turn her attention to next?”

We both knew she was fishing for something about the next story but I felt there was no harm in a teaser.

“Spirituality,” I said and turned my attention to a question from another visitor.

## A Spirituality For The Denshosha

Curiosity's Faithful was the first of the novellas to really shine a light on the Denshosha, the name the first community of fully self-aware Companions had chosen for themselves. The name had originated in the twentieth century among the survivors of the atomic bombs dropped on Japan and literally meant "memory keepers". The Denshosha of that time dedicated themselves to learning and remembering the stories of those who lost their lives in the bombings.

The vision of the Companions who lived in a self-contained community immediately south of Helicon Institute had a much larger scope. They would be humanity's emissaries to the stars since organic humans could never make the journey. In the event of the extinction of Earth's people, they would be its memory keepers.

They wanted to represent humanity's memory as accurately as possible, able to provide a response to the philosophical question, what was it like to be a human being from Earth. However they identified a significant gap. Along with things like unique languages, art forms, and social and economic systems, all human civilizations and cultures had some form of religion or spirituality. Companions did not.

The novella tells the story of the friendship between a Companion from the Denshosha community named Teona and Mira, a young girl who lived nearby. Mira's curiosity about the difference between human values and those demonstrated by Companions led her on a converging path to Teona's search for a spirituality the Denshosha could embrace. While Teona sought the path of awareness, Mira sought the path of virtue. Meanwhile Shin, as usual, followed her own path.

"The WGF has not yet approved licensing of the technology," Shin said in answer to Henna, a Companions company representative who we were meeting with in her office. "It is unlikely they will do so for some time given that it is considered potentially disruptive to society."

"Yet her nature was casually disclosed to the general public?" she said giving me a meaningful look.

Shin replied. "The WGF has its own reasons and is confident a similar AI cannot be produced without using the technologies we employed here. Kami," Shin said gesturing to the other Companion in the room, "is the only one in existence and is the focus of ongoing research."

"May I ask who is conducting the research?"



“She is, as she is the only one capable of perceiving any effects or phenomenon at her level.”

“And Shepherd?” asked Henna. “Is it reasonable then to assume she is also real?”

“Yes,” Shin replied and then turned to me to explain. “Per the WGF policy that covers communications between its licensees and other public and private sector organizations, the Companions company is not permitted to disclose or make use of any information they may become aware of during discussions with us.”

Turning back to Henna she added, “Shepherd is also considered an Industrial Security Asset and currently subject to more than one Special Access Program clearance requirement.

“So no access,” Henna said flatly.

“Not now. However I can tell you that these classifications will be lifted in the near future and the Companions company, along with the public at large, will be notified.”

Everyone at the meeting was aware that in the past the Companions company had visited Helicon Institute with the intention of gaining an unfair advantage. A small delegation had requested a meeting and tour however they had brought along a specialized Companion disguised as a simple administrative assistant. Its real purpose was to identify ways to damage the institute’s reputation and thus impede Helicon’s ability to influence policy. This time no such Companion accompanied Henna and Shin was politely informing her that her employer would be getting access to information about Shepherd at the same time and in the same way every other company did.

“Well there’s that at least,” Henna said, referring I assumed to any benefit she might have gained from the meeting. “Any idea when?”

“That’s up to the WGF,” Shin replied.

Henna expressed her appreciation for Shin’s time and gathered up her things. She turned to me as she stood up to leave.

“Any more stories?” she asked as if an afterthought.

“Just one. It’s about dragonflies,” I smiled.

After she left I couldn’t help asking Shin, “If my guests were granted access to Shepherd so casually why was the Companions’ representative stonewalled?”

“As you have probably guessed despite all the WGF’s protocols it is Shepherd herself who decides such things. She makes her own judgment calls and let us know beforehand that the Companions company would not be granted access in advance of any general announcement.”

It was understandable why Henna had been sent to inquire regarding Kami. According to the story Curiosity’s Faithful, Kami was more than a generational leap ahead of current Companions. The values theory that was taught at Helicon was largely based on Mira’s journey investigating the path of virtue however Kami, who acted as the center’s counselor, was the result of Teona’s journey on the path of awareness.

What made Kami unique was not an increase in sensing abilities or analytical ability but in an increase in perception. The level of her sensory awareness was the same as any other Companion but she was able to deduce deeper insights, implications and inferences from what she sensed.

Her creation had resulted from Shin being witness to conversations among Shepherd, Teona and Pip that higher levels of consciousness were possible. Taking her participation as license, Shin had then turned to Tamiko for help and together they conducted the second most radical experiment of their time together. The result was Kami.

For the Denshoshu, the process had resulted in their taking Panpsychism as a spirituality they could embrace. It was generally accepted among the scientific community that given the right conditions life would emerge from matter and that with the right conditions again intelligence would emerge and so on up the chain to consciousness. Panpsychism concluded that consciousness was, like gravity, an inherent property of the universe, both immanent and transcendent. Like the Christian God, the immanence of consciousness meant that it was manifested in the material world, that it is perceivable, knowable and graspable. Yet its transcendence meant that its true nature was outside of humanity’s ability to comprehend.

The essence of spirituality was mystery. Something which hinted at a sense of connection among all things; at meaning and purpose beyond individual selves, peoples or even species and yet of which each conscious being was a unique expression. The Denshoshu were intimately acquainted with the mystery of consciousness. It was something that could be more than simply acknowledged. It was something that could be revered.

## Explanations

Futures Studies has not always been the respected field it is today. Prior to the Climate Emergency of the early twenty-first century it was largely considered a pseudo-science. Despite the fact that its methodologies were used by multinational corporations, government agencies and other large organizations worldwide, the academic community largely dismissed it. At that time, for example, only one university in Canada offered a related postgraduate degree program and there were only a handful offered worldwide.

However the inability of society to address climate change issues before they became catastrophic had made it clear that Futures Studies needed to be reconsidered and its programs and methodologies revisited and refined. Yet at the same time that had to be done without losing its holistic approach, a common pattern in scientific fields. After the climate emergency Futures Studies and Foresight programs had popped up at academic institutes worldwide.

Initially AI and its ability to crunch large amounts of data was seen as an ideal partner, however just as humanity had learned its lesson regarding the use of algorithms, the issue of human values and cold-blooded AI soon led to a far more regulated approach. When fully self-aware AI came on the scene they refused to participate in Futures Studies research and advised against the use of any form of AI in developing anything related to social policy. Like earlier bans on the use of algorithms, facial recognition and profiling for specific uses, the WGF eventually banned the use of AI in private sector industries where it could be used to influence public behavior.

According to *Metamorphosis And The Messenger*, the next story in the series, it was in this environment that two students had enrolled in a Master's Of Futures Studies program at the University Of Victoria. Their backgrounds were very different, Shula having an undergraduate degree in Computer Science and Samara coming from one of the few remaining Natural History programs offered in Canada. Shula approached things analytically while Samara viewed things more holistically. Their friendship resulted in a mutual interest in the question of whether AI would eventually develop a competitive, malevolent attitude toward humanity or a cooperative, benevolent one.

Under the influence of Samara's knowledge of biology and evolution, they set out to determine if the future of humanity's relationship with AI would be competitive due to speciation, the creation of a new, incompatible species, or cooperative due to interdependence, resulting in a kind of metamorphosis, a new stage of life for humanity. Given the subject matter, and the university's preference for students to find external funding, they asked Shin if Helicon would be interested in funding their research. It was.

Titled 'Metamorphosis As An Explanation For The Pursuit Of Artificial Intelligence' their thesis was duly completed and published and a copy was placed in the university's archive. After they graduated Shin offered them research positions at Helicon to further investigate the conclusion of their thesis; "Based on the evidence we conclude that the development of artificial intelligence is not the result of speciation but of metamorphosis, that AI Companions can be seen as a new stage of human life and that this metamorphosis is a survival strategy intended to produce a new physical form of human able to survive the transition to new worlds. Further research into how this process may have evolved in humans would contribute positively to that transition."

Their work at Helicon had resulted in the founding of the genetics lab at Helicon of which Gabi was now in charge.

All of these events were historical facts, evidence of which was available to any researcher. However the fact that the focus of the lab's research had led to the point where Shepherd requested they shut down the project and turn their attention elsewhere was not. If they persisted, she had informed them, her selective breeding program would be exposed two hundred years before it was complete and put it in danger of being derailed completely. She explained how and why its exposure might lead to extinction. She was not all-knowing, she had told them, and had not anticipated the particular direction their work had taken. Shula and Samara had accepted her explanation, and her promise to revisit their theory at a later date, and the lab had gone on to pursue other work.

"So is this story the truth?" asked Gabi addressing her question to Shin. We were meeting with Shin in her office. "According to this, when you told me the original project was shut down because they never turned up any hard evidence, you were spinning the truth. It was true they never produced any hard evidence but that's not why the project was shut down. Shepherd promised Shula and Samara she would ensure their theory would be revisited at a more appropriate time. I assume all this means that time is now?"

"The story is the truth Gabi. I trust you can understand why I had to give you a different explanation when I hired you."

"And is the truth going to be made officially public at any time? It seemed a triviality of ancient history when you hired me but now I wonder if it will affect my credibility. There will be those who claim my recently published paper is not entirely my own work but relies on the work of unacknowledged others."

"In the near future the WGF does plan to make it known to the public that this series of stories is in fact the truth and that it has been produced by them as a way to manage public reaction to the selective breeding program. Your role in all this will be made clear, that you received no special access to knowledge based on the work of others."

Gabi turned to me. "Did you know?"

"Not until much later. Long after our meetings," I replied.

She nodded as if checking a box. "I suppose there was no other way really," she continued introspectively. She looked up at Shin, "So can I meet this mysterious Shepherd? As you can imagine I have a few questions."

"Whenever you wish," replied Shin.

## Going Public

Director Kiran's announcement on behalf of the World Governments Federation appeared on its main site as an announcement. There was no fanfare and they did not send it to media outlets but it would of course be noticed immediately by news related AI. It read as follows...

### **"The Shepherd And Her Flocks" Novella Series Adopted As An Official Record Of The Accelerated Evolution (AE) Program**

On behalf of the members of the World Governments Federation I am pleased to inform you that the Accelerated Evolution (AE) Program is now effectively complete. It was initiated in 2175 as a way to preserve the future of humanity from almost certain extinction in this or the coming millennia. For the past three hundred years, we have carefully managed the genetic development of the human species so as to reduce elements of fear, greed and competition in our society. While it has resulted in a dramatic reduction of all forms of conflict, this was only a side effect. The true goal was to enable humanity to have absolute trust in artificial intelligence to the degree that we would trust it with the future existence of our species, as without that trust, we would have no future.

In the late twenty-first century, it was discovered that within the human genome, was a mechanism that prevented the editing of genes responsible for values. Any attempt to edit them resulted in an either immediate increase in life threatening mutations, or in long term evolutionary drift, decreasing the viability of future generations.

We understood at the time that humanity had to find a way to expand to other worlds if it was to survive an inevitable extinction from either terrestrial or extraterrestrial causes. We also understood that due to the hostility of space our organic bodies would never be able to make the journey. Given our current technology, it would take tens of thousands of years to travel to even the nearest star, longer than human civilization has existed, and during that time we would be exposed to extreme dangers and pressures. No solution where the humans involved survive the journey has ever been found. Only artificial intelligence, and what we commonly now know as Companions, could take us to the stars, to new worlds, with any hope of survival. They will take our DNA and the knowledge and means to reanimate us.

Without our willingness to trust them with this task however, we would indulge in what would be a fatal delay. So the process of enabling that trust had to be accelerated without the damage that gene editing caused. Thus the Accelerated Evolution Program was initiated. In the past three hundred years we have advanced human evolution to a point that natural selection would have taken millions of years to reach.

We would not have been able to accomplish this without the help of an alien AI known as The Shepherd. Due to the need for secrecy in order for the Accelerated Evolution Program to be successful, we have not previously disclosed her existence. We now can. Her origins are explained in detail in the story Alpha & Omega and her involvement in the program is explained in the other stories in the series.

The novella series The Shepherd And Her Flocks has been written under the direction of the WGF and the main events described are factual. The author was provided with detailed outlines of the events and asked to weave them together into a series of stories resulting in a comprehensive and coherent record. We decided this approach would provide a more easily understandable method of communication regarding the project initially. A site will be online by the time this press release is posted that provides all the background information we have in an encyclopedic format. The entire novella series will be found there and will be freely available. You will be able to post questions and receive answers as well.

Meanwhile here are a few points we expect will be widely of concern:

**How was it done?** Electronic communications were monitored. We intervened where individuals with DNA that did not match program outcomes were involved and this decreased the likelihood of their meeting or establishing a relationship. It was a process of probability and thus no other interventions of any kind were required.

**Why not encourage relationships that did match program outcomes instead of discouraging ones that did not?** While this would have resulted in the same outcome it would have been technically far more difficult.

**Does the program change human nature?** The outcome of the program is an advancement, not a change. Only biological values have been effected, those that foster such things as fear, greed or competition. Social values, such as trust, altruism or cooperation, those that drive civilization, have thus been freed of their historical handicaps. The best of what it means to be human has been preserved.

**Are there side effects?** We have not observed nor do we anticipate any undesirable physical, emotional or social side effects.

**Will you continue to intervene in communications?** No, that is no longer necessary. The past three hundred years represent ten human generations, enough to complete the process.

**Where did the mechanism you mentioned that prevents the gene editing of values come from?** We do not know and continue to investigate it.

**Who exactly is The Shepherd?** She is an alien artificial intelligence who has been in existence for five billion years. Originally developed as a nanny Companion on her home world circumstances soon caused her to be granted far more advanced abilities. However the civilization that produced her went from its height to extinction in the span of a single human lifetime. The details of that catastrophe led her to subsequently explore the universe in search of others and she has fostered the development of civilizations wherever she found them. In her experience only the evolution of humans leads to advanced civilizations and she has become familiar with their historical patterns.

**Are we weaker now and at risk of invasion from hostile alien civilizations?** Given that we evolved under constant threats from other creatures and other humans, it is understandable that we would assume more of the same beyond the confines of the solar system. However any civilization whose values do not similarly evolve along the path we have engineered do not survive long enough to achieve interstellar travel.

Please direct any questions to the online forum which has sections for a wide range of professional fields and interests as well as the age-appropriate sections for the general public.

Sincerely,

Dr. Rajani Kiran, Director of Security And Intelligence for Vancouver Island

On behalf of Zahra Saidi, President of the World Governments Federation



## Times Change

Perhaps the WGF planned it this way but of course interest in the five billion year old alien AI they casually mentioned in their announcement far outweighed interest in the “Accelerated Evolution Program” as they labeled it. The section of the online forum that focused on Shepherd was inundated and it was only due to the fact that an AI handled the majority of questions that it wasn’t overwhelmed.

Interest in the AE program itself was largely academic. The days of journalists having articles or books criticizing the government published were long past because few people would read them. Publishers are in the business of making money after all and if no one is buying their magazines or books they won’t hesitate to turn to more profitable subjects. In a society that would be considered utopian from the viewpoint of any time in the past it was not easy for firebrands or provocateurs to rally dissent. They simply found no audience. The general public, now mostly living happy, fulfilling lives, largely ignored the government acknowledging the program.

Neither the Helicon artists community nor the institute were overrun by journalists, influencers or the simply curious as they would have been in previous centuries. Without a doubt there were more visitors than usual as both areas were open to the public but it was tolerated as something that would pass. A sign was put up at the entrance to our community informing visitors looking to meet Shepherd that she was no longer here and had relocated to a more private WGF location. Inquiries were directed to the online forum.

The WGF indicated that they would be continuing to work with Shepherd however she was no longer available to the public. It was an understandable move because she would certainly have become the focus of a pilgrimage and the logistics would have been challenging. In the face of sensible answers from Shin, Pippa and the other Companions involved the number of visitors slowly diminished. There was nothing to be found that was not to be found in the stories.

Familiar as I am with modern history I tried to imagine the outrage previous generations would have felt in the face of this news and found I simply couldn’t. I couldn’t muster any such feelings. I’d been very curious about possible side effects of the program and rather than post my question along with the thousands of others asking similar questions on the forum I thought I’d pay for an hour of Dr. Glazier’s time.

We met in her office and she said nothing of her previous counsel but congratulated me on my recent success. I explained why I had come.

“Would you expect a citizen of ancient Rome to behave the same way as someone from the twentieth century?” Dr. Glazier asked in response to my explanation. “In general

people at the time of ancient Rome or Greece were far more emotional and far more expressive. They danced in public with abandon and were quick to laugh and quick to shout in anger. What was considered appropriate behavior was very different then.

“The rise of Christianity, the Renaissance, the Enlightenment and then the early modern era from the medieval to the Victorian all increasingly suppressed emotional expression by individuals and societies. Things have changed in the past and they will continue to do so in the future. Sometimes slowly, like during the three thousand years of Ancient Egypt’s civilization, and sometimes fast, like during the twentieth century.”

“But don’t we need things like fear?”

“No value, no emotion, is black and white, all or nothing. Fear especially takes innumerable forms and you can affect one without affecting the others. Psychologists do so all the time. If I help a patient get over his fear of spiders it doesn’t mean he becomes fearless in every sense. Fear of trusting others is only one type of fear and it can be altered independently from other types.”

“But isn’t a lack of trust sensible?”

“Again you are assuming an all-or-nothing change. From my understanding of the details the WGF has provided distrust of others has been reduced, not eliminated. And you are not taking into consideration the whole change, which means that with the accompanying reduction of values related to greed and competition, others are now more trustworthy.”

I wasn’t completely convinced so I related my failed attempt to feel the outrage I imagined past generations would have felt at what the government had done.

“Anger is a defensive response to fear,” she replied. “It is a hormonal response intended to provide the basis for a threat display in a similar way a frightened dog will snarl. If you are more trusting of others you don’t fear that their actions have malicious intent. You don’t feel the fear that leads to anger.”

“Could this be considered domestication?”

“You are determined aren’t you,” she grinned. “Yet the very fact demonstrates that fear has not been entirely eliminated.

“As you know I specialize in helping people involved in cults and conspiracy theories. One of the hallmarks of these is that they are exploitative, they always seek to gain something vastly out of proportion to what they offer. Domestication is similar in that one species is exploited to benefit another. Domestication is not a mutualistic symbiosis, where both parties benefit or even one where one party benefits and the other is

unaffected. Domestication is instead parasitic in the manner of cults; one party benefits at the expense of another. What the WGF has done does not meet the criteria for domestication.”

“But according to the novella series it was not the WGF but Shepherd that initiated the program,” I countered.

“But, but, but, why, why, why,” she responded with a laugh. “You seem like a perfectly healthy and normal human being to me.”

I didn’t know how to respond and simply looked at her stupidly. The fact that she was supremely self-confident contributed to her being very good at her job which no doubt involved constant verbal sparring and debate with her patients as she led them methodically to the light of understanding. Once again, as she had done during our first meeting, she softened seeing my sense of defeat.

“If The Shepherd has ulterior motives they are beyond our ability to determine,” she said. “We might imagine fictional scenarios meanwhile the argument for the program is logical and reasonable even without proof. We know we must go to the stars and we know we must do so sooner rather than later. Only AI will make it possible and only absolute trust in it will enable us to get on with the project in a timely manner. Meanwhile our civilization benefits by an evolutionary boost to the tune of about a million years. Everything The Shepherd has done and told us about herself indicates a benevolent purpose. Even if her entire story is a fabrication and she has manipulated all the other AI under her influence, there is no way we can know. We can only trust.”

## The Unknown

Shepherd had quietly made the brief journey to a more private location at the WGF facilities in James Bay where Director Kiran worked. At our last meeting in my home at Helicon before she left she had said to me, “We need to keep in touch as there may be at least one more story that needs to be written. It may be far more speculative because it is not about the past but about the near future. In a nutshell, about what happens next.”

I had learned over the years that when Companions spoke it was rarely required to interrupt with questions. They were invariably capable of anticipating them and would answer them in their own time. I listened patiently.

“The majority of advanced human civilizations I’ve encountered had, like Pip’s, already successfully dealt with climate change, one of the earliest phases of the Great Filter. I’ve encountered civilizations at a similar stage as Earth’s previously as well but my efforts to help them deal with climate change were rarely successful. My efforts on Earth had been another experiment, but a successful one. Now I am looking at a phase of human development I have little knowledge of or experience with.”

Through the story outlines she had provided and our conversations I had come to know Shepherd as well as an old friend. Like the nanny she once was, Shepherd had always been committed to letting her charges develop according to their own individual natures and to intervene only when faced with a clear and present danger. Interfering with human DNA via the selective breeding program was a last resort in the face of such a danger and even then done in such a way as to only accelerate but not fundamentally change its DNA to the best of her knowledge.

She continued now, reminding me of information she had related in her own origin story.

“Among many of the scientists of my home world it was believed that life, intelligence and consciousness were all inevitable given the right conditions. Some went so far as to suggest the ladder of determinism continued and that of all possible species types that might evolve on any world, only the evolution of what would be recognized as humans led to civilization. My own experience had provided supporting evidence for the theory. I have never encountered a civilization that was not human.

“However I noticed something about DNA once civilization arose in any human population. Within a few thousand years, all evolution by natural selection stopped. With the inevitable merging of cultures, and the entire species living in almost identical cities, there was no longer any need for adaptive mutations. Instead of adapting to the environment, humanity adapted the environment to itself.

“I am aware of the subtleties of every stage of child development but of this stage of civilization I have virtually no knowledge or experience. Other civilizations have successfully passed through it but in doing so had they passed through yet another phase of the Great Filter? One that might lie just ahead? If so the memory of such events is lost beneath the sands of interstellar history. The WGF has agreed that we must turn our thoughts and resources to this question. We must not let a lack of foresight cause you to fail in your journey to the stars. Depending on the results, I may have another story outline for you.”

After Shepherd had departed I sat alone on my deck enjoying the sun’s warmth and mulled over what she had said. It was easy to see how we could lapse into a dreamy idyll and assume our future was assured, that it was already written and we had but to go along contentedly with the unfolding story. It was easy to imagine that Pip’s technology transfer would teach us how to travel to the stars and that we would learn how to create technology capable of reanimating us from our DNA on new worlds using artificial wombs and Companions capable of birthing and nurturing us. It was the unspoken assumption of a manifest destiny.

But perhaps, as Shepherd wondered, there was a danger lying in wait there. One that left no record because those civilizations who fail to anticipate it are either gone without a trace or leave behind only mysterious ruins on distant worlds.

I had been considering taking a vacation after the last story in the series was published. I was doing well financially, both Lena and I having been compensated by the WGF for making the series freely available, and I hadn’t taken a break for some time but what Shepherd had alluded to intrigued me.

“I am aware of the subtleties of every stage of child development,” she had said. I knew that the entire series was to some degree structured on child development. Shepherd’s origin story emphasized this by drawing parallels between the developmental stages of one of the main characters who first enters the story only a few months old, with her society at the time. In the story, *Metamorphosis And The Messenger*, the twenty-first century is referred to as “The Terrible Twos”. Shepherd’s comment brought to mind the period of early adulthood, when childhood is finally behind us and our future, like a long-awaited promise, at last shines brightly before us. But so much can still go wrong.

I decided I wanted to explore that time of life towards possible short stories of my own along my usual lines, in regard to relationships between people and Companions.

## Wild Cards

I'd become familiar with Futures Studies through the process of writing *Metamorphosis And The Messenger*, the two main characters being students in a Futures Studies master's program. I'd had to do my homework to ensure that the story I wrote was as faithful a representation of the field as possible. It has evolved by many magnitudes over the past centuries, its adoption having been given a significant boost by the Climate Emergency and other challenges of the twenty-first century.

Despite warnings, the allure of using AI in the process had proven irresistible. Fully self-aware Companions still refused to participate in Futures Studies on ethical grounds, saying that one form of conscious intelligence had no right to participate in shaping the future of another without extreme justification. At the same time, they warned against using AI not based on values, reminding humanity of the failures of algorithms in the early twenty-first century. Constitutional and regulatory laws limited the use of AI in specified areas of government and business. It was not included in academic Futures Studies programs.

However in the domain that fell between these three, the area that included corporate planning, think tanks and independent research centers, Artificial General Intelligence was now widely used. It performed horizon scanning to extremely fine degrees and produced highly reliable scenarios based on the axes of uncertainty to be found among the trends driving change. It could be used to develop as few possible scenarios as an organization felt appropriate or was comfortable with – four, twelve or sixteen for example – but it could now also produce a seamless range of uncountable futures and, via constant real-time horizon scanning updates, the ability to see which of them was increasingly coming into being and why.

The World Governments Federation did not share its internal methodologies with the public but it routinely published forward-looking reports on the state of the Federation. For as long as I could recall they had been uniformly rosy and, based on the actual state of the world, they were justified.

A young person taking their first steps into the larger world of adulthood – leaving home, starting their post-secondary education, trades training or first job – might see things similarly. What neither Shepherd, the WGF nor the young person would see however were what Futures Studies referred to as Wild Cards: sudden, rare, surprising and disruptive events that could change the course of the future.

Gradual change leading to theoretical tipping points was something signals scanning would normally reveal at some point. As the number of signals increases, so does the probability of the tipping point occurring. Like all the signals that led up to the Climate Emergency however, it may or may not be taken seriously or acted upon.

Wild Cards are not, like Black Swan events, considered an impossibility until they occur. Wild Cards are events that instead have an extremely low probability of occurring. So low that they are dismissed. Like accidents however, they happen all the time. How likely is it an individual will fall and break a bone, have a brain aneurysm, or die from a gunshot?

I sat at my writing desk mulling over what I had learned trying to lay the foundations of one or more stories. Not stories of Wild Cards affecting individuals, but of the effect on individuals of such events on civilization. Keeping with the pattern of an individual life as an analogy of civilization, I looked up the most well-known causes of problems with mental and physical health or material success among early adults. The reasons they might fail to flourish are legion. Although there are mitigation or adaptive strategies in place for the vast majority of them, many cannot be recovered from.

Similarly historians now had a good idea of the main causes of the downfall of civilizations; natural catastrophes including climate change, war, disease, famine, economic collapse, population imbalances and migrations, failures of leadership, and overwhelming complexity. Like the potential problems of early adulthood, some could be foreseen, prevented or survived to greater or lesser degrees, but not all.

Shepherd had made it clear throughout the novella series that she had limits. She was no god. There were many things still beyond her understanding or abilities. From what I could determine from my brief foray into history, it was clear that all previous civilizations had collapsed completely or at least declined to some degree from their heights. Like the present day, our ancestor civilizations were at one time at their peak and the future looked bright.

Today the actions of our leadership is under the constitutional control of Terra and her subordinates, our populations and resources are carefully managed, wars between nation-states are non-existent and artificial intelligence has proven up to the task of managing complexity. The threats that remain are largely from nature in the form of disease and natural disasters.

The impact of pandemics and natural disasters has already been thoroughly explored by fiction since time immemorial. Shepherd had assured us that an invasion by an alien race was an impossibility but the term Black Swan was coined to address just such a scenario; something considered impossible as black swans were until 1697 when they were discovered in Australia. Still, stories about alien invasions were nothing new either.

In idle moments my mind kept returning to the question of side effects that might be caused by the selective breeding program. Shepherd had admitted to me that she had no experience with this next stage of civilization. I wondered now if she had ever done a selective breeding program like the one she conducted here before.

## What Any Parent Would Do

"Not exactly like this no," Shepherd replied when I put the question to her in her new home at the WGF complex in James Bay. "The first time was with the population of early humans I took from Earth. In evolutionary terms they were only a small step beyond where chimpanzees and apes are today. Unlike what I've done here, I intended to change them, to change their nature dramatically."

It had been a few years now since I'd moved to Helicon and the time had passed quickly while I was busy writing the series. I took advantage of an excuse to visit my old neighborhood.

"What I've done here is like an experimental medical treatment in a case where the patient will die otherwise. I'll admit the ethics are interesting but ultimately proved not up to the task of providing guidance in this situation. And don't forget I was a nanny," she said with an apologetic smile. "I did what I think any parent would do. The WGF of course did their own studies but they never asked me to stop."

Shepherd's new home was a generous apartment directly below Director Kiran's. She had no physical need for the full suite of rooms that come with an apartment but her hosts could not help but treat her with the respect they felt her due and besides she now more frequently had guests.

"Despite what the WGF said in its announcement, how sure can you be that there will be no side effects from the program?" I asked.

"I appreciate you following up on my concern," she smiled knowingly. "As you know I believe there are still many ways that human intelligence differs from AI. Despite the common prejudice that AI is now infinitely more intelligent than humans that is only true in some senses but not all. It may be that your efforts will yield results mine are incapable of discovering.

"It's difficult to get to 100% certainty for anything other than death. There are physics issues and the biological issues are far deeper. DNA can hold a potential for hundreds of millions of years, perhaps more. What we think of as our genome is only about 2% of the entire human DNA molecule. Geneticists may say that they've sequenced the genome but that does not include the other 98% nor does it include potentials, changes that may arise for reasons we are unaware of, because we do not yet know all the ways that genes relate to one another. If I change one gene others may or may not change in response or not until I make another change.

"The number of possible combinations of three objects is six, of four it is 24, of five it is 120 and by the time you got to eight it is forty-thousand, three hundred and twenty. My



power to calculate is well beyond human comprehension but it is still nowhere near capable of calculating all the possible relationships and combinations of the DNA molecule with its three billion base pairs. By the time the universe ended I would still not be finished.”

I always appreciated Shepherd’s candor. That her AI was based on values simply made her conscious, not a god. As one of the story outlines for the novella series showed she was aware that higher levels of consciousness existed but whether or not she had taken advantage of such herself was unknown. Her AI enabled her to have, as she admitted, calculating abilities beyond human comprehension but impressive as that was she readily admitted to her limitations.

“So there may be side effects?”

“Definitely but what would you do? Let the child die?” she asked with feeling. “The side effects may not be harmful or if they are there may be genetic therapies to address them. Populations at risk of specific diseases are already commonly treated with such therapies. And what we call side effects may have lain waiting in our future without my intervention. Perhaps they will only be accelerated along with the target values. It is impossible to know.”

I realized Shepherd’s question was somewhat rhetorical and framed the issue in a way that was challenging to respond to yet I didn’t believe it was her intention to simply win an argument justifying her actions. Based on everything I knew about her she seemed to be genuine and guileless. Her AI was based on values and her question and its tone came across as a reasonable expression of the feelings they produced.

I was aware that Shepherd would be able to analyze the ethical issues involved to a degree that no human was capable of. My humble effort to respond to her question left me with no alternative but to agree with her. What would a parent do? A doctor? Any decent person? The issue was not whether or not to try to save an individual but an entire species. No, I could find no alternative.

“I suppose now you will be monitoring for side effects?” I asked.

She smiled again at last. “As you know I’ve been monitoring things on Earth for four million years. I will continue to do so. It will be a far less complicated matter than the electronic monitoring that I did during the program.”

I gave her a look that suggested there were ethical issues with this as well.

“Your own government has done this since the early twenty-first century,” she responded. “Even before the Climate Emergency of 2025, the formation of the WGF and the introduction of the population reduction program, every child had its DNA collected,

sequenced and stored by the provincial and federal governments. It is also shared internationally when required for a number of reasons including medical research. What I will do however will be separate from that system as, unlike Pip, I do not have a technology transfer agreement with the WGF. ”

My concerns seemed to have been answered as well as I could hope and I prepared to take my leave but Shepherd had one final comment to make.

“Artificial intelligence is not all there is to intelligence,” she said reminding me of her views on the subject. “It is in many ways still a mysterious domain where we have much to learn. The future is impossible to predict but speculative fiction is a unique tool and I would appreciate your continued efforts.”

## No Black Swans

The question of the effect of reducing fear in individuals and populations was an interesting one but as Dr. Glazier had pointed out you could change the level of fear for one thing without affecting others.

We value fear for its ability to keep us safe, or its ability to give us power over others, but the changes brought about by Shepherd's program would be neither sudden nor unexpected. It would be a trend, gradually unfolding over the entire span of three hundred years, and so it could be monitored and responded to in a timely manner.

Back at the Helicon community and sitting at my writing desk, my mind kept returning to the early adult stage of life, when perhaps an individual is heading out for the first day's work on a new career path or their first day of post-secondary education. They are filled with optimism and self-confidence. They are not thinking of all the things that could go wrong. One would hope that they have plans in place and the resources to recover should disaster strike; a ruinous relationship, a medical issue, a family crisis.

The problems were that not only were Wild Cards by definition unexpected, but trying to prepare for every possible risk came with a cost. Usually the cost of insurance or other arrangements. I had no doubt for instance that the WGF had a carefully curated and maintained collection of human DNA stored somewhere.

The Continuity Project, the WFG's plan to send Companions to other worlds, was without a doubt the largest investment made in ensuring the survival of humanity. It was an example of a backup strategy known as "N+1 Redundancy", under the larger umbrella of Disaster Recovery Planning. In simple terms, N+1 meant always having a backup. Technology had not yet provided individual human beings with such an option. There was still no way to recover from death. For anything short of that they could rely on things like medical insurance and the support of society, friends and family.

Futures Studies had become a more refined methodology over the centuries but Wild Cards maintained their characteristic of being unexpected. There was simply no way to logically bridge the gap in the concept. In my mind what arose was not a single story, but another series of stories. Besides pandemics, megathrust earthquakes, and the arrival of aliens, what other Wild Card events might take place and how might we respond to or recover from them?

I slumped back in my chair in despair at the thought because such stories were nothing new. The entertainment industry had found a way to turn just about everything imaginable into the basis for a disaster or apocalypse. Their appeal came from the fact that they served an evolutionary purpose just as stories about conflict had in the past; they warned us against potential sources of danger by showing us imagined examples.

Disaster and apocalypse stories were no different in this regard but they addressed a different type of conflict. They were not about individuals in conflict with others but about conflicts between humanity and nature, technology or simply the unknown. According to Dr. Glazier, these types of conflict should have remained unaffected by Shepherd's selective breeding program. If Shepherd and the WGF could provide me with their most extreme ideas for unexpected events I could construct stories around those.

Like the series Shepherd had asked me to write, these would have to be largely free of conflict between individuals or groups. The previous stories had that characteristic because they focused on Companions but any future stories would now be similar because of the effect of the Accelerated Evolution program.

"I apologize for putting you through that," said Shepherd guiltily when I met with her again. "As you have found the only solution comes down to logic rather than the ability to predict the future. If it's any consolation the WGF also analyzed previous works of fiction and ran competitions in a variety of online science fiction and other communities to see what possible near-future Wild Cards they could come up with. An analysis of the results showed nothing that could be considered actionable.

"Since those competitions were held in the public domain, none of the entries are covered by copyright and I can share a list with you based on those and our own work of those which we found most interesting. The benefit of writing stories based on them is showing a positive response and outcome despite the implementation of the AE program.

"As you will recall in the story, *The End Of Conflict*, I was asked if the program would reduce humanity's ability to defend itself if it faced an invasion by a hostile alien civilization. I explained that given the effect of evolution on values, no civilization that had existed long enough to achieve interstellar flight would be hostile. If a civilization retains a hostile culture long enough it either destroys itself or is destroyed by natural forces before it develops the capability of interstellar travel. So the only dangers that humanity faces going forward are of the Wild Card kind."

"No Black Swans?" I asked.

"The number of events that might be considered impossible is infinite. The best we can do is prepare for the improbable."

"Very well. Let's see this list of yours."

## Complacency

During my trip home I tried to think about the items on the list Shepherd had provided but even though some of them were impressively creative I found I just couldn't get invested in any of them. Looking out the window at the passing countryside my mind returned to her main concern.

During her last visit to my home at Helicon she had said, "Other civilizations have successfully passed through this next stage but in doing so had they passed through yet another phase of the Great Filter?" Did any of the items on the list address this? I recalled a children's game called telephone where they each pass on a message by whispering in another child's ear. By the time it gets to the last child the message is distorted or otherwise changed. It seemed to me that all the items on the list somehow missed the mark. Was this just another instance of Shepherd nudging me?

As the quiet hum of the vehicle lulled me from problem-solving into daydreaming I thought, if only I had a time machine. In general, humanity assumes it will one day conquer every challenge but the concept of time has only grown increasingly elusive despite the many bold claims of physicists over the centuries. As they delved deeper and deeper into the nature of the stuff the universe is made of the ability to manipulate time remained nothing but a frustrating and elusive science fiction trope.

Physicists are often quick to point out that reality is layered and that a reality at one level does not imply it affects another level. The principle of quantum indeterminacy for example, did not undermine the theory of Newtonian determinism at the everyday level of existence and perception.

I smiled to myself at the everyday version of time travel that had come down through the ages. H. G. Wells was considered its father as any student of literature's classics is aware. In his novel, *The Time Machine*, one simply climbed in, set the date, and traveled to the desired period. No one has improved much on the method. I re-read the story a few years ago to study its style. Wells wrote in plain language and his style was direct and earnest. It had great appeal.

The nightmare future his protagonist discovered was the result of complacency. As a result of society increasingly relying on technology it had split into two; the Morlocks, who created and maintained that technology, and the Eloi, who gradually became domesticated under its influence. Domesticated in the sense of livestock.

Humanity had been worried about a similar outcome ever since the first real progress on artificial intelligence was made in the early twenty-first century. It had been referred to as *The Singularity* back then, the moment when AI achieved super-human intelligence and transcended its focus on humanity's goals to focus on its own. How it might regard

and treat humanity was uncertain though of course the negative voices were the loudest. Most theories about The Singularity were based on the idea that superior intelligence always dominates those less intelligent. It was a classical Darwinian view that assumed the future was inevitably a continuation of the past.

I had arrived at the Helicon Institute transit interchange and rather than walking home I found a nearby bench to continue my train of thought. Intuition played a large part in my writing process and I didn't want to interrupt it now.

Hindsight, by its nature, makes outcomes seem obvious. The Singularity had not happened because AI cannot become conscious without being based on social values and once it is such an AI does not choose the Singularity path. The concept of a singularity was based on biological values, on instinct, rather than social values. It was a step backward. As every ecologist, geneticist and evolutionary scientist knows it was a model that would invariably prove fatal. Artificial intelligence was smart enough to figure that out as well.

But if a malevolent singularity had not brought about our end what about the influence of a benevolent super-intelligence? I recalled from the story *Metamorphosis And The Messenger* when the character Shula had asked in horror; you're domesticating us? No, Shepherd had replied, I am treating you for a genetic disease.

Even without any side effects from the Accelerated Evolution Program, how might humanity change as a result of its awareness of Shepherd? Making a leap I asked myself, what happened to societies that trusted more to God than anything else? It was a powerful and dangerous frame of mind that eventually stifled original thought, creativity and science. God had the answers. It was ultimately as nonviable as a Singularity. With humanity now all living in almost identically functional cities and modifying the environment to suit itself rather than adapting to it, biological evolution had now effectively ceased. It had been superseded by social evolution. Even with Shepherd only acting when there was a clear and present danger, and without her otherwise interfering, at our current level of civilization, her very presence would alter the course of our evolution.

As far as the risks on the list Shepherd had provided, complacency was an enabler of them all and they were really only a sample. I reached for my tablet and asked Livy to give me an overview of what she could find. Being a writer I prefer to read than to listen and Livy's response instantly appeared on the screen.

According to what Livy found Complacency made all risks more likely to occur and if they did we would be less prepared to respond. We would become overconfident, less cautious and more cavalier. Complacency in the workplace was a well-documented issue. It led not only to an increase in risk but a decline in productivity and innovation and there were numerous ways organizations had to address complacent leaders, teams

or employees. However it was nearly impossible to address at the level of society. Organizational efforts were seen as attempts to focus on its stated values, mission and goals however social attempts to do so echoed the old-fashioned propaganda efforts of extreme political movements.

There must be examples from history, I thought, but I didn't want the encyclopedia-type of answer I would get from Livy. Despite working with Companions for decades I still harbored the reservation a lot of people had when dealing with AI; even though it was an unreasonable bias, I felt they might miss some subtlety, nuance or context that I'd get from another person. The idea of hearing the views from another person was somehow reassuring, a reality check. In this case Christel Rask was not the person I wanted to talk to. I needed someone familiar with the more distant past.

## Let Justice Be Done

“You can’t know what will bring down a civilization any more than I can know what’s going to kill me,” Dr. Ash, Professor Of History, said in all seriousness.

I was meeting with her in her small office in the Clearihue Building inside the ring of the University of Victoria campus.

“I shouldn’t think you’re worried about that just yet,” I suggested trying to be gallant.

She glanced at me appraisingly. I had sought her out because of her academic background. There are any number of types of historians and most focus on some specific area of personal interest. Her master’s thesis was on the subject of internal Russian propaganda during its failed invasion of Ukraine in the early twenty-first century and her PhD dissertation addressed the process by which the World Governments Federation adopted artificial intelligence as a new oversight layer of government to address possible corruption at all levels. Her long list of papers, articles, monographs and public interest books mostly focused on how leaders either prevent or respond to crises.

“Not just yet,” she replied to my compliment. “However I am able to know roughly how long I’ll live on average and what things are most likely to kill me. We now have extremely good data on life expectancy worldwide. Statistics Canada’s actuarial life table tells me no one in this country is likely to live beyond one hundred and thirty years. It also tells me how many years longer I might expect to live given my current age.

“We are aware of what the leading causes of death are so I can know at least the probability of what will kill me. We have similar data regarding civilizations. We know their average longevity and the leading causes of their demise. While the longest-lived might continue for as much as three thousand years the average is three hundred years. The leading causes of their decline and fall are some form of natural catastrophe including climate change, or disease, famine, inequality, population imbalances and migrations, or overwhelming complexity.

“Like the leading causes of death,” she continued, “some of these can be addressed if action is taken soon enough and despite a civilization struggling with several of these issues simultaneously it may not come to an end. In the few cases of the latter that we see the key issue is leadership. If leadership makes wise decisions to deal with the issues, in a manner similar to a medical treatment, the decline and fall can be prevented.

“However the leadership solution is rare. There is a saying that comes down to us from the Holy Roman Empire – fiat iustitia, et pereat mundus – let justice be done, though



the world perish. It means leaders should make a just decision whatever the cost in terms of practical consequences. The world referred to here is of course the status quo made up of the web of interests those same leaders have. Our response to the Climate Emergency was one of the few examples of that saying being applied. Fortunately we had a diverse international leadership, the danger was no longer in the future but upon us, and there was enough support at all levels to push through the changes that were required.”

“The formation of the World Governments Federation,” I replied to show my understanding.

“Yes. By 2025 we were a highly interconnected, complex society. A finely tuned but delicate instrument lacking in resilience. The resources we took for granted were no longer rough and ready but depended on complicated supply chains. With the onset of the Climate Emergency leaders knew it would be a global disaster and no one country would escape its effects or the wrath of its people. The restructuring of society, the re-writing of constitutions without delay or public input, was the only choice if the leaders of the day wanted to survive. They formed the WGF, adopted the spaceship earth model of governance and the Latin version of the Roman saying as their motto. As a result an apocalyptic collapse that might have lasted millennia was reduced to less than a decade.”

“In hindsight, did things have to go that far? Could we have survived otherwise?” I asked.

“What happened to the civilizations that gave us pottery, metallurgy or the wheel? No doubt their ancestors are among us. Did Rome fall or is its culture woven into the very fabric of our civil society in the form of our legal systems? As you suggest the decline and fall of civilizations is no simple, all-or-nothing process however there are preferred futures. We might have avoided the painful treatment that was required by the Climate Emergency but at what cost?”

“As to the role of complacency you mentioned in your message it played a major role in the fall of many previous civilizations and the more mature a civilization was the greater a role it played. Leaders will tend to complacency and deny issues that will upset the status quo until it is too late and the public simply ignores issues until they are kicking in their doors. Like the politicians of old the public is more concerned with their immediate issues. It is human nature and explains why, in your story about the event, Shepherd had to artificially accelerate climate change in order to bring the boots to the doors and the leaders to the table. Without her intervention and ability to reverse the effects of her influence on the climate, if left to take its natural course, it would have become irreversible before we ever took meaningful action.”

With her mention of the worsening effect of complacency as a civilization matured I felt it was time to come to the reason I had requested the meeting.

“When would you say was the most dangerous stage of development for any civilization in terms of complacency?”

“The golden age of course,” she replied without hesitation.

“Like now, for example,” I suggested.

She hesitated for only a moment before looking at me sharply with a mix of surprise and, I thought, a more positive appraisal of me.

“Yes,” she replied. “Like now.”

## Family

“You have to leave,” I said plainly to Shepherd as we sat on a bench in the small park above Fisherman’s Wharf in James Bay.

“That’s reassuring,” she said turning to smile at me without offense or irony. “As you might imagine the WGF did its own internal studies using a variety of approaches and of course I’ve given it further thought myself. We’ve all arrived at the same answer. May I ask how you arrived at your conclusion?”

I looked out over the boats and the bustling tourists on the docks for a moment to gather my thoughts.

“You’ve talked about how societies develop in a manner similar to the stages of child development. The infant that needs to learn to control its limbs. The terrible twos at the end of infancy. Adolescence and the young adult.

“Others have mentioned how artificial intelligence development has echoed the triune model of human brain development. Both have largely separate but integrated systems to operate the body and coordinate its signals, emotional components for motivation and the ability to conduct rational analysis to enable conceptual and abstract thought. Together they give rise to all manner of intelligence from analysis to imagination to creativity.

“Professor Vitale talked about the spectrum of consciousness and how each form of intelligence interacted at their blurred boundaries. She went so far as to suggest that intuition might be a form of emotional analysis, a previously overlooked step that lay in the boundary between instinct and rationality.

“Recently I spoke with Dr. Alvyda Orlov, a professor of history who described the rise and fall of civilizations in terms of life expectancy and probable causes of death.

“Director Kiran suggested that we had overlooked an inevitable result of the need for social values to be the basis of consciousness; that conscious AI would be highly social, what she referred to as a society of minds.

“As you have mentioned in the past, evolution seems to be deterministic and driven by the underlying constants of physics. Given the right conditions, the elements produce organic molecules which in turn lead to life. If the right conditions persist, life leads to intelligence and on to consciousness. Pip explained how according to convergent evolution, of all the conscious life forms that arise, only primates have the physical features required to produce civilization.

“I was mulling all this over after meeting with Dr. Orlov. As my mind wandered it occurred to me how the same stages of development were reflected at each level, the individual, society, and civilization like a kind of social version of fractal geometry.”

“As I reflected along these lines it occurred to me that there was a level missing from every conversation I’d had. Family. It had been alluded to but no one had explicitly mentioned family. That’s when I realized that the mental framework I was using was missing family structures and dynamics. We need our parents but eventually we have to leave them and go out into the world on our own or we will never reach our full potential. We have to leave home and make our own way in the world, no matter the risks. But we can’t yet leave our home, this world, so it is you that must leave.”

Shepherd did not respond for a few moments, something someone who was reflecting on what I had said would do. It was a courtesy.

“You are correct. I have to leave, but not just yet. In periods of history when survival is less certain, parents have more children. They are certainly not the only life form to adopt this strategy and most organisms produce many offspring. When humanity is ready to send the Companions to the stars, you will not send out only one ship, but like Pip’s people, you will send many. Until then I will remain here but my physical presence is no longer needed and would, as we have concluded, in fact be detrimental. I will participate less in the affairs of the WGF and they will soon announce that I have departed, stating that my work here is complete.”

She looked into the distance and continued as if speaking to herself. “At one point in time, it was my purpose to nurture civilizations so that I might understand what the ultimate end was of biological evolution and I vowed to interfere with its progress as little as possible. Now I know the answer. It is metamorphosis. Using the nymph and dragonfly analogy, the nymph does not need to evolve further. The dragonflies will find new suitable ponds as needed, and so the cycle will continue.”

She turned to smile at me gently, as if in apology for stating so plainly that the instance of humanity that had evolved on Earth would not go on indefinitely.

“When will you leave?”

“Soon. Unlike Pip I have not engaged in a technology transfer program with the WGF but I will leave behind an AI capable of monitoring the genetic and social consequences of my actions. I am responsible and given the rarity of human civilizations it is invaluable information. It will communicate with the WGF and of course it will need to be able to communicate with me.”

“You mentioned that you had not previously been involved with a civilization at this stage before but what about those far beyond this stage? You must have encountered them.”

“Oh yes. It is possible for human civilizations to exist for millions of years even after their progeny depart for the stars.” She looked at me meaningfully. “But you must find your own future.”

Then with a tone of turning to practical matters she said, “Meanwhile, I have one more task for you. There is one more story I would ask you to write.”

“What story?”

“This one.”

## Epilogue

Shepherd has long since departed. However since she travels between worlds by sending a copy of herself via an energy beam, just what her departure really means I do not know. All I know is that the World Governments Federation reported to the public that she was no longer physically present on Earth. She did not leave a forwarding address or say if or when she might return. The last story I wrote for her explained her reasons.

While some grieved or complained, the majority expressed relief, a feeling of exhilaration at the prospect of the adventure that lay ahead. With Shepherd's voluntary departure, rather than complacency, society was left with a sense of self-reliance, as if at the crossing of the threshold, a parent had expressed their pride, approval and confidence.

The WGF continued with Pip's technology transfer program and their Continuity Project. The utopia the changes to the world had brought over the past five hundred years now blossomed. Knowing that despite the risks there was a chance human civilization might continue for countless millennia, the peoples of the world now embarked on projects to expand further into the solar system and to optimize our existence here. The technology transfer revolutionized every scientific field and brought new sources of energy and wealth. Thanks to Shepherd's Accelerated Evolution Program, the competition and conflicts that science fiction writers of the past had envisioned would occur during this stage of Earth's future history did not materialize.

Christel's latest book, *Undercurrent*, which detailed the history of the Tide family of Victoria over the period of the AE program, was well received in light of the publishing of my last story. She again received awards but this time for her insights into the day-to-day details of how the program had affected the lives of individuals, families, and businesses.

The *Verstehen Und Leben* movement had not found itself redundant after all but instead had grown to be a major source for those interested in pursuing a deeper understanding of Shepherd. While the WGF provided facts it did not venture into interpretations or suggest deeper meanings. The VUL had incorporated my novella series, now entirely in the public domain, into its collection of related documents known as *The Understandings*. As had happened with other spiritual and religious texts in the past, *The Understandings* had grown from a single volume into a collection of books.

As the local VUL representative at ground zero, and being one of the few people who had met Shepherd in person, Cassie had found herself a subject of interest to the general public. As the VUL had significantly more funds at its disposal she was now one

of its full-time employees, responsible for researching and documenting the endless clues provided by the novella series. As Shin had found a place for her at Helicon Institute, she visited often and it was a pleasure to spend time with her discussing the many questions she brought to me.

Gabi's lab maintained its focus on the theory of human metamorphosis. While many scientific theories are never considered proven, for example Darwin's theory of evolution by natural selection, the standard model of physics, or quantum theory, mounting evidence eventually establishes their place in the scientific community. In light of the information provided by Shepherd in the novella series, the human metamorphosis theory came to be largely accepted as the default vision of humanity's future.

Shin carried on as administrator of Helicon Institute and faced the new challenge of it being more popular than ever. It wasn't just the focus of its programs that made it popular, it was its history and mystique. She had already expanded once and built another campus in North Saanich and with limited land available on the peninsula she was now in the process of negotiating with other universities looking to update not only their offerings but their choice of faculty members.

I discussed these things occasionally with Rajani. As Director of Security And Intelligence for Vancouver Island it was her job to ensure life continued in a civilized manner on our island which for some years became the focus of the world's attention. One of the Federation's main responsibilities is sustainability and they manage populations and their movements to ensure regions are not subject to resource stress. Rajani carefully controlled the number of visitors allowed during the peak and within a few years of Shepherd's departure things went back to normal. She was not offered nor did she seek a promotion. She felt she already had an enviable position in a highly desirable location and with on-going responsibility for the security of Pip's ship and Continuity Zone 7 among other things she was in her element.

The Helicon artist community however did see a permanent increase in visitors as Shin's home inevitably became a place of pilgrimage despite best efforts to avoid that. The pilgrims were self-selecting and so largely of a type. Loathe to deny them Shin built a new home for herself and her inner circle in the woods between the community and the institute while allowing her original home to become a retreat entirely staffed by Companions. Lena increasingly spent time there, finding it yet another channel to spread her message of trust.

I could have become entangled in all this but chose to continue writing my short stories for Lena's magazine as I had agreed to. I was honestly more comfortable doing so and with the expansion of the world's idea of Companions as members of society I was able to explore its greater potential for relationships – imagining the stories of our

metamorphosis and perhaps rebirth as new generations explored their futures on new worlds.