Its 2064, and the average temperatures are 6.8 above normal, and rising-

(A sci-fi account of how humans might deal with worst case climate change.)

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Preface.

This is a Sci-fi account which aims to show how humans might be able to demonstrate their resilience in dealing with the worst-case scenario of a climate change catastrophe. It focuses on the lives of some of the inhabitants of Long Island in New York state, the USA. The main character decides to have his body frozen in 2024 using a quick freeze cryostat when he finds he has very advanced cancer and is given only a few months to live. He is unfrozen in 2064 to have his cancer successfully treated, though gradually finds that the world has undergone very extreme changes over the last 40 years which result in the demise of 90 % of the world's population. Yet he finds himself with a group of humans who find ways to not only survive into the long term but who also decide to fight these changes while living happy and productive lives. Let's hope nothing like this does happen though if it does, we hope it finds such a response.

NB: Not suitable for children under 15 to read.

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Chapter 1. The planning (2024).

It was Donald Benroth's big day. He had just turned 60, and his few friends had made sure he had the best day ever. Why? Because just two weeks ago, he had been told by his urologists that he had advanced prostate cancer, and it had spread widely to many other parts of his body. He was advised that it had advanced so extensively that the specialists all felt chemo or radiotherapy would not be able to control it. In their opinion, he had four months to live at the most and he had better get his affairs in order.

Donald was not a religious man, though not an atheist. He just was not a believer. He lived for the present and had amassed quite a fortune in real estate in New York city. Suddenly all his dreams of retiring and enjoying the rest of his life relaxing fishing and playing golf were in tatters. His wife had been his business partner, though they had not been able to have children, and had drawn apart, leading to their divorce. She lived separately and had set up her own real estate business, having received a separation benefit of five million dollars. Hence, he had no one to leave his fortune to and would make sure no charity would ever receive it. Donald was not that type of person. He was a self made man and not accustomed to being generous. He was very competitive and had no respect for anyone who was not. However, he was not sure what he would do with it.

Yet, Donald was not the type of human to just lie down and die. He had searched the internet for all the proposed cures for cancer, though was no fool. Even though desperate for a possible partial cure, giving him a bit more time, he realized all the proposed cures were unlikely to provide any respite for more than a few months, and were not worth their extremely high costs. Though in reading widely about cancer research, he had come to the conclusion that it was highly likely that within the next two to three decades, there would be many further genuine breakthroughs in the development of cures for this dreaded disease using something called 'T cells'. If only he could last until then!

However, in his searching he also came across a large American company in New York state that claimed they had discovered how a mammalian body could be frozen, and they believed could be kept preserved in that state for up to five decades before being thawed and returned to its original state. It required a rapid freezing system using liquid nitrogen. They had tried it on a number of large animal species like pigs and gorillas (making sure the 'cruelty to animals' people did not hear about it) and had kept them in their cryostated state for four years before allowing a slow thawing to take place. After carrying out a wide range of comprehensive tests, they had found the animals had totally returned to their previous natural state, with their brain functions having returned to normal within four months from when the thawing

commenced. The company was so convinced that they would be able to achieve the same with humans, that they were offering opportunities for anyone, especially those with uncurable cancers or autoimmune diseases, preferably under 70 years of age and not too advanced with the state of disease, to undergo this process. They stated that even if some organ damage had already occurred, it was highly likely that within around three decades, stem cell transplants would almost certainly be available to repair or replace any damaged organ systems.

Donald had always been a risk taker, and in the majority of the cases, he had been pleased with the outcome. 'What the hell', he cried out. Obviously this cryostating system had lots of risks though what an experience it would be if he were able to be thawed and surely by four decades time there would be both a cure for all his cancers and stem cell regeneration systems for damaged organs to ensure he could see out at least another twenty or thirty years. And the thrill of seeing what life was like then would be an amazing experience. He contacted the company to discuss what was involved and to ask how they could guarantee his cryostated body would be satisfactorily maintained in that state for four decades. They stated that his frozen body would be in his personal thick steel walled cell where the temperature would be kept at -60^{o}C every minute of every day with special emergency safety systems to ensure this temperature would be maintained constantly during the 40 years

The location where the cryostat cells were located was nearer the centre of Long Island, near Jane's Hill, which was the highest part of the Island. The cryostat company were aware of the scientists' claims that with climate change there could be a considerable increase in sea levels globally so made sure their cryostat station was near the highest part of Long Island. Donald became increasingly convinced it was a good risk option. However, he also wanted to know how he could be sure that, on his reinstatement to an active live state, he would receive the best cancer cures and stem cell regeneration at that time.

He decided to employ the services of a young attorney and have a legal contract drawn up that could not be ignored or changed within at least 50 years, to ensure this would happen. Donald had around 70 million dollars saved and in investments, so could cover the 40 million fees for the cryostating and maintenance of his frozen body until 2064. Also, his bank, the New York Bank of the Future, which he was certain would not falter in that time frame, assured him that, as he was technically still alive during that 40 years, they would maintain his accounts until 2064 and beyond as required. They guaranteed that they would refer any major decisions in the intervening time to the young legal attorney he had chosen to ensure all would happen as he had planned. Donald was hopefully that, now at the age of 24, the attorney would still be alive in 2064 to ensure his recovery would be carried out as he

had planned. It seemed wise to pay him well, around $25,000 a year for the 40 years of oversight of his finances and his frozen state, and a sum of one million dollars once his body had been successfully thawed, and his cancer cured. The attorney was happy with this contract. Donald signed all the necessary forms, including the one from the cryostat company absolving them of all responsibility if his reawakening and cancer treatments did not go to plan, though stating that they undertook to make every reasonable attempt to ensure that it would. The arrangements were made for him to be cryostated in a months time. He had a second party organized for two weeks time, at which he would tell his friends of his plan.

Donald lived a relatively simple, in fact, monotonous life, working long hours including weekends for the last 30 years. He had only a few friends and did not have time for many extra activities except for the occasional game of golf on Wednesday afternoons. He never gave a thought to what life might be like in 2064. It would be very different, though he was certain the USA would still be a world leader, and that overall, it would not be that different in terms of those things he was interested in. He only listened to Fox news, which would have unfortunately totally misinformed him about what was happening both in the USA and globally in terms of potential changes in the years ahead. He was a sort of Trump follower, though did not really get involved in politics so long as the politicians did not interfere with his ability to make money and make him pay any higher taxes. In fact, to be honest, he was a bitter, bored, disillusioned, grumpy old man. He had expected to have a large family and to have enjoyed seeing his grandchildren in the years ahead, but that was not to be.

Donald was vaguely aware of some idea being floated around that the world's climate was heating up, though he did not believe this was or would be happening. It seemed the same as when he was a lad, even though they seemed to be getting a lot more bad weather recently, though that was probably just another cycle. He believed it was just a left-wing rumour, so not of significance to his plans. He knew New York would still be there as it is now, even though electronics will have changed many ways they do things.

Even though many of his friends pleaded with him not to go ahead with this plan, he was adamant that it at least gave him a possibility that his body could be healed, and he could still enjoy some years of life. The alternative, to spend the next few months possibly with rapidly increasing poor health and knowing that each month could be his last, did not appeal to him for one moment. On the 20th of September, 2024, his body was snap frozen in the automatic controlled frozen cell environment, to remain there until 2064. His cell was protected against all power failures, and with such comprehensive locks that could not be operated except by a senior staffer at the Cryostat unit, and in contact with his attorney, until 2064.

However, Donald was not to know that the world he was leaving would not exist in 2064. Almost 90% of the world's population will have perished by then and the survival of the human species hung in the balance. However, he was to be one of the lucky ones not only to survive but also make a great contribution to human survival into the future.

Chapter 2. The awakening in 2064.

It was the 20th of September, 2064, when Donald Benroth was to commence having his cryostated body gradually released from its long term frozen state. This thawing of his body had to be a very slow process to ensure that the walls of the 37 trillion biological cells that made his body would not be too badly damaged by too rapid a change in temperature. His body remained in the same steel lined cell, though the staff were able to control the temperature of the apparatus which had maintained his body well frozen, and gradually manipulated it so it would within a number of days revert to -20°C. From then on the temperature rose by 1°C each day. It took another 6 weeks before his body temperature was mostly at 20°C, when he sensed any neural activity, though just. It was mostly only just fog. Another month passed before his whole body, even the innermost organs and tissues, had returned to the 37° Centigrade (98° Fahrenheit) temperature that was normal for a human body. His conscious state was gradually regaining its old memories, and its inquisitive ability. And he even realized he was hungry.

Donald was intrigued to find that most of the staff looking after him were robots, though they were all dressed in white suits. The few humans that controlled them wore masks and gloves to ensure no infections could upset the recovery process. They were all under the control of an elderly woman who was also dressed similarly. It suddenly dawned on him that he was fed in an entirely different way from what he was used to. When they offered him something to eat, his menu was very strange, naming each category according to its protein, fat and carbohydrate content, with appropriate vitamins and minerals added, and taste required as the final part of the request. He noticed the robot going to a large cylindrical structure outside his room and punching a series of buttons. It all tasted like what he had asked for, though had no appearance of it. However, it satisfied his hunger quite adequately.

The first time his attorney visited was a very special moment, though Eli was now in his mid 60s and his hair a silver grey. His attorney seemed to be a changed man and would say little, except to assure Donald that everything had all so far gone to plan and that his finances were all doing well. Eli advised him that as soon as he was considered physically ready, he would have his cancer controlled and his damaged organs regenerated. What a relief he felt. However, Donald was totally unaware that the world had undergone such a rapid, extreme change in climate and that he was going to have to live a very different life to the one that he had expected to find.

His attorney, Eli Siegelman, of Jewish ancestry though secular in his lack of religious conviction, had been chosen by Donald to look after his affairs because he was Jewish and young, and he felt could be fully trusted to act in a totally truthful and

ethical manner and still be alive when the 40 years had passed. And Eli had fulfilled all these requirements. Even so, despite his typical deficient American education about the world outside the USA, the dramatic changes that were taking place to result in a constant deterioration in climate, which began to bite over the next 40 years, made Eli realize he had to learn more about other nations and peoples and how they were coping. He was an extremely intelligent man, and despite his lack of scientific training was determined to find out as much as he could understand about the science describing how and why these extremes in climate were happening.

He had never married though was not gay. Eli just liked living independently. He just did not think it was wise bringing children into a world where the future looked very bleak. It had soon become so obvious to him and most Americans that almost everything on Fox news was fake news and watching it was a waste of time. He began to read some of the newspapers from Great Britian and many other countries that had a reputation for telling the truth using the English language. Ironically, he found the New York times to also be one of the most reliable, basically truthful sources of world and local news, followed by the Washington Post.

Eli was pleased to be able to learn how other countries were faring and what actions they were taking. He was also aware that Donald was very ignorant of the real world when he was hired in 2024, and that he needed to be very careful in helping him come to grips with the world of 2064. The human in charge of the cryostat unit advised him not to tell Donald anything that would deeply distress him until most of the rehabilitation, cancer treatment and stem cell regeneration had taken place. When after three months thawing, it was assessed that Donald's body was functioning in most essential areas, he was sent to a rehab centre to help get his muscles working effectively and ensure he had the majority of his functions, biological, physical and mental, back to working order. The human in charge of the cryostat unit assured him that within a month his cancer treatment would commence and be followed by stem cell regeneration of any damaged organs or other tissues. Up until now, he had been in a totally enclosed environment within the closed steel cell in which his body had been preserved, so he was fascinated when, to transport him to the rehab centre, he was placed in a metallic type of cocoon shaped structure which floated in mid-air. It had a small window for him to look out. The staff told him it was wise to wear a mask when exposed to other human residents as there were many viral infections prevalent within the village and provided one for him to wear. They wished him well, knowing that he was the fourth human they had thawed successfully in the old rooms built 50 years ago out of steel. The cocoon was programmed to take him to the rehab centre,

ensuring the instructions as to his impending cancer treatment at the local health centre were enclosed.

As soon as he left the steel enclosure, he entered a world he just could not quite comprehend. For a start, the cocoon was able to float in midair and move at a steady pace with no motor sounds or wings. What type of system had they invented? Some sort of anti-gravity mechanism? Then, he observed that most of the buildings were made of a type of glass, some sections opaque, though with many transparent viewing squares. But what intrigued him most was that all the buildings seemed to be under a great glass like dome. He was aware that other cocoons were sailing around everywhere under the dome surface, rising over buildings, seemingly all controlled to avoid any collisions. This was certainly not the old New York environs he left 40 years ago. The cryostat station had been right on the outskirts of the main city, near the centre of Long Island, though he now realized that the old cryostat station was one of the few steel constructions left in that village. What had changed all that? He could see through the glass dome lots of heavy, dark clouds which almost obliterated any sunlight outside the dome. However, there were lights everywhere in the dome making it seem like a sunny day.

It seemed a short time to when his cocoon entered a doorway which automatically opened and his transport came to rest. He was helped from the cocoon by four robots and placed into a wheelchair. Then someone whom he was sure was a real human as she wore a mask approached him and welcomed him to the rehab centre. She seemed to be very young, though did not appear too different from what young women looked like 40 years ago, even though covered in a white overall. She advised him of the type of treatment he would receive, including the many electronic devices that he would never have seen that would hasten his rehabilitation. She assured him they would have him up and running within a month, after which time he would enter the health centre for his cancer treatment.

He asked her could he have any visitors, thinking of his attorney. She assured him he could. He was desperate to know what had resulted in the changes he saw. Donald was taken by a robot in his wheelchair to his room, though he suddenly realized it was a wheelchair with no wheels. It just floated. The whole building was made of glass, and his room was no exception. There were transparent sections enabling him to see out, though his bed also floated. He felt in a total daze. It was all too much to take in. He lay down and went to sleep, helped by the potion the Nurse in charge had given him.

Donald was woken by robots around what to him seemed like sun-up time, to commence the usual health checks and exercise routines to get his muscles working. He had not obtained a watch or a phone yet and had no idea what the date would be.

He had a vague idea that it should have been Christmas and then New Year around that time, though no humans mentioned it. He was not aware that everyone in that village was living in a state of emergency survival, and that many of the old traditions had been largely forgotten in the desperate fight to survive. When it was time to rest, he manoeuvred his bed close to the transparent section of glass so he could see what was happening outside. The endless procession of cocoons seemed a constant. However, he could see the dome above and make out the very heavy clouds above it. It seemed as though there was a major storm, with what looked like baseball sized stones of ice bouncing off the dome. The dome was apparently made of glass, yet what type of glass would not be smashed by such hailstones? He could not see the surrounds of the dome at ground level, though could not wait to do so. Again, he kept thinking, what the hell is going on here. It was so different from the old outer suburbs of New York City he left 40 years ago.

He asked the robots to explain the dome and how the cocoons were propelled, though each one said they did not have that knowledge. The young human lass in charge said that was all she had ever known so was somewhat puzzled when he described what his old environment was like 40 years ago. He longed for his attorney to visit. When he did, Donald had a myriad of questions to put to him.

Eli advised him that the world of 40 years ago had changed in many ways. So many aspects of the world's climate had changed radically not long after he was frozen, causing them to live in very different ways from that in 2024. However, as he had been advised by the medical staff not to get his client too distressed, he agreed to begin to describe as slowly as he could the progression of changes that had occurred starting around 2030 beginning at his next visit, and progress slowly through the decades to where it was at today. He would try to keep the most disturbing aspects until after Donald's cancer treatment.

Eli did agree however to explain that the glass which now seemed to be the basis of all infrastructure was carbon fibre strengthened with some extra mineral additives, making it as strong as thick steel. For the last 25 years, it had proved too costly and carbon emitting to smelt steel and the discovery by an Australian company of ways to make glass super hard and shatter-proof had out competed steel, wood and cement as the main materials to fabricate buildings. And it could be manufactured using electrical driven heating and moulding, thus not requiring fossil fuel derived energy which was decreasingly available. It had proven to be as hard as steel. So that's why the large hailstones just bounced off it, Donald thought.

Eli also told him that the cocoons and wheel chairs and beds were made of particular metals controlled by electromagnetic forces, and their location or path of travel could be directed by programming a quantum computer AI system combined

with the satellite directed global positioning devices, both carried out through the control panels. He also said that these cocoons could only travel inside the domes, where the required equipment ensured such travel could safely function. Eli did not tell him that normal car, plane and boat travel using fossil fuels was no longer possible. Such drastic changes might be too troubling. Even what he told his client left him somewhat confused, though Donald had this vague memory that a type of electromagnetic transport was being tested by the Japanese before he was cryostated. What about the dome? No, said the attorney, that will come later.

Chapter 3. Donald learns how the world has changed in 40 years.

Donald's rehab treatment worked wonders, and he could sense the strength returning to his muscles. This also made him feel good in himself, though he was anxious to get the cancer treatment started asap. Eli agreed to visit each week, and Donald anxiously awaited these visits, to hear about how the climate had changed so markedly while he was frozen. During the first visit Eli explained that 7 years after Donald's cryostat treatment in 2024, the weather seemed to become more severe and hot in north America, Asia and in Europe particularly. In winter there were three metres of snow piled around the streets and parklands of NY City for three months continuously, making transport almost impossible. In summer, the temperature on at least six occasions reached 44° C (111° F), followed by a set of tropical storms of such ferocity that caused devastation not only to buildings but also food crops and farm animals. The frequency of tornadoes in north east USA had greatly increased, and were covering a wider area of the country than had previously happened.

Eli went on to explain that during the early 2030s the average world temperature had increased from the preindustrial levels by a dreaded 2.1°C, way above the 1.5°C level that the United Nations had set as the highest peak beyond which all countries working together must not allow it to exceed by 2030. It was then that even the sceptics were beginning to wonder if the climate scientists were correct after all, and that our world climate was heating up rapidly, in fact far more rapidly than anyone had predicted. Even Fox news had to reluctantly admit it may have been wrong in doubting the climate science.

Scientists reported during the 1930s that the amount of carbon dioxide (CO^2), the main greenhouse gas causing temperature rises in the atmosphere, had reached 443 parts per million (ppm, i.e., the way low concentrations of chemical substances are measured against all other constituent molecules present) by 2031. It had remained at around 220ppm for centuries up until the Industrial Revolution during the late 1700s and early 1800s, though had risen to 318ppm by the 1980s, then to 421ppm in 2024, and was continuing to rise exponentially. And the methane levels were rapidly increasing, being released at a fast rate from the rapidly melting ice sheets where it had been trapped for many centuries, at both north and south regions of the globe, as well from most glaciers. And methane was known to be a much more powerful greenhouse gas than CO^2. Also, the average rainfall levels were greatly increasing in some areas, while extreme drought persisted in others. There was certainly a much higher level of water vapour in the atmosphere, presumably because of the increased heat in the oceans. It was known that this increased level of water vapour in the atmosphere also exerted a strong green-house gas effect, so also contributed to this more rapid increase in average world temperatures than had been

forecast.

Eli explained that farming was becoming increasingly difficult for many regions around the entire world due to the totally unpredictable weather, with extremes of heat and cold, and ferocious storms producing increasing sizes and quantities of hailstones in some regions. It was apparent that many animal species were struggling to cope with the increasing heat and difficult weather patterns. Most of the sea dwelling creatures were moving north and south away from the equator quite rapidly, making fishing so much more difficult. Sea levels had risen by around a metre through a combination of heat caused expansion but mostly because of the more rapid melting of land ice sheets and glaciers, producing greatly increased numbers of icebergs. Some of the lowest levels of human habitation around sea-shores were now proving to be unsafe places to live, despite sea walls being built. These were frequently breached by the increasing tidal storm wave surges.

In the larger industrial countries, values of sea front properties were rapidly declining. No one wanted to risk living there. The sea rises were greatest around the tropical regions and the residents of the Seychelles islands, with nowhere greater than two metres above high sea levels, had to all evacuate. Djakarta in Indonesia now had at least a metre of sea water throughout most of its lower streets. Fortunately, the new capital was now established high up in the mountains of Borneo. Most of the old capital's wealthier residents were moving to other higher locations, though were unable to sell their mansions. They just vacated them, allowing the poor to move out of the flooded areas into these vacant apartments in higher areas of the once great capital of Indonesia.

The one good thing was that the world's population numbers quickly plateaued out. The death rates particularly in the poorer countries had greatly increased due to heat stroke and as victims of extreme climate events. Viral diseases had also greatly increased and killed millions. What was to be done? In the early 2030s the United Nations Secretariat called emergency meetings of both climate scientists and world leaders. A number of emergency measures were discussed though the very wealthy and powerful coal, oil and gas producing and using nations managed again to stall any effective decisions to curb the burning of fossil fuels. They kept pushing for research into carbon capture and other ways to deal with the effects but would not accept that they also needed to consider the main causes of these temperature rises. None of these carbon capture schemes had so far proved to have more than a minor effect.

The good thing was that many nations were at that time quickly getting into green hydrogen production and increasingly using it to fuel their steel furnaces and electricity production. Many countries had come to rely solely on solar and wind driven electricity. Almost all cars and trucks were now electrically powered, the types

of batteries used to store the electricity now having greatly improved and their quality strongly regulated to result in less danger of unexpected fires. It had caught the world's population by surprise that, despite considerable reductions in burning fossil fuels, the temperature was still increasing rapidly. They did not realize that the increase in world temperatures itself damaged so many of those biological and physical buffering factors which had kept it low, which were now no longer able to do so. It was now causing these temperatures to increase way out of control.

Another good outcome was that so many of the territorial disputes between nations were now put on the back burner. Many countries were progressively moving into survival mode. Even the Russian attempt to invade and wipe out Ukraine which had moved to a stalemate status, was at last abandoned by Russia which had seen such drastic reductions in temperature and excessive flooding throughout many of its regions and these were now urgently requiring the army to spend most of its time helping rescue many of these residents.

During his second visit a week later, Eli described how during the late 2030s, climate change really gathered momentum. By the end of the 2040s decade the average world temperature rose to 4.2^{o}C above preindustrial levels, and the concentrations of CO^2 in the atmosphere increased to 591ppm. Even though increasing numbers of nations were now abandoning burning fossil fuels, some were forced to increase their use to generate energy needed to cope with the climate change based problems.

Also, it was evident that at such temperatures, many of the plants which sucked CO^2 from the air were dying. Even more importantly, many of the trillions of phytoplankton, cyanobacteria and shrimp and deep sea plants in the oceans were now finding it increasingly difficult to survive. Those down to around 200 metres below the ocean surfaces had been continually producing around 70 % of the oxygen that most sea creatures needed to live. Now the oxygen production at these levels had greatly decreased. As well, the rapidly increasing acidity of the oceans through the dissolution of CO^2 was making it difficult for those deep see creatures which form their protective carbonate and keratin shell like coats, to continue to do so. These microscopic sea creatures could not survive both the acid and the increased temperatures.

For the last two billion years these sea creatures had removed many gigatons of CO^2 from the oceans through their ability to photosynthesise CO^2 and to make their carbonate coats. They no longer could make this huge contribution to keeping these concentrations of CO^2 low, thus leaving the oceans to quickly become supersaturated with this gas. This resulted in the increasing numbers of dead plankton and shrimp bodies sinking into the ocean beds where their decaying bodies began to produce

even more CO^2 and methane, which was then released into the atmosphere. Fortunately, this reduction in oxygen production in the oceans did not have an impact on the atmospheric levels of oxygen. Those levels produced in the oceans mainly supplied what was needed to keep the living systems in the oceans alive. The atmospheric oxygen levels had built up over the centuries to such amounts that were unlikely to be greatly affected by the temperature rises.` Eli then told Donald that the next great calamity in terms of global climate change was when, beginning in 2038, the many kilometre thick ice caps over both Greenland and some Antarctic regions began, due to the excessive amount of melting, to slide from their elevated locations into the surrounding valleys. Some fell into the sea. This saw not only a number of extremely large icebergs floating further towards the tropical regions, but also a considerable increase in sea levels, up to 4 metres by the end of the 2040s. Such large hunks of ice were slow to melt, though once in the oceans they increased the seal levels by the same volume as would occur when they melted, as Archimedes had pointed out would happen. The large increase in the number of these icebergs from Greenland cooled the local oceans so much that within a few years, the warm north gulf stream progressively reversed its direction, as had happened millions of years ago, and then brought a cold current to northwest Europe. This resulted in the climate in the northwestern European nations becoming like that experienced in Siberia. It became impossible to farm in the way they had since recorded history, and the whole of Europe was eventually plunged into a food crisis. Fortunately, some of the countries in other regions that were still farming were able to export millions of tons of grain and meat, vegetables and fruit to help them, though they knew they would not have the funds to maintain this importation for long. It was also evident that fish and other sea food numbers were rapidly declining, largely due to rapid increases in sea temperatures. Globally a sudden reduction in the production and distribution of food caused a major world crisis. However, many of the old British scientists vaguely remembered reading about an old British geochemist named Lovelock. During the second half of the 20^{th} century, he had predicted that all this change would happen if we allowed the greenhouse gases like CO^2 and methane to reach such high concentrations to have the Earth's average temperatures rise to current levels. Lovelock had also predicted that the populations of sea creatures would seriously decline with heat rises above 2.5^oC. He had forecast that food levels generally would be so seriously depleted that it would be necessary to again mine whatever concentrated sources of fossilised carbon rich deposits like coal, oil and gas were left in the ground, so they could be reconverted back to the biological proteins,

fats, complex carbohydrates and vitamins and minerals that the plants and microorganisms that formed them had originally been made of.

Eli tried to explain to Donald that the oils and gases were formed from the mega trillions of these small sea creatures that on dying fell to the ocean floor to be covered by ocean minerals when the oceans had become saturated in them and under pressure converted into oil and gas. Coal had been made when many centuries later, the leaves and wood of so many plants dropped to the ground and were covered and compressed by soil movements to become coal during major upheavals involving tectonic plate migrations and erosive weather events. However, Lovelock also forecast that reconverting these fossilised carbon rich deposits to the original organic molecules would require a very large amount of energy, much more than was available in the late 1900s when he made this forecast. Many scientists considered these forecasts to be far too radical, though they were now happening, and even more quickly than Lovelock had forecast.

However, the scientists realized that they now had the power to convert these fossil carbon rich deposits back to the proteins, carbohydrates and fats that were essential to human survival. Eli explained that in 2034, the first of two commercial fusion driven nuclear power stations had commenced to be built, one in Sweden, in a combined project with Britian, the second in the USA. He tried to explain as simply as he could that this system involved exposing nuclei of four hydrogen atoms to such high temperatures as occurs in suns to convert them into a single atom of helium, thus releasing large amounts of energy in the process. He explained that this was quite different from, and far more efficient than the fission system that was widely used well before 2024 and was still being widely used. The fusion system produced much greater levels of energy and left few radioactive products, whereas the fission system left an enormous amount of radioactive material which needed to be safely disposed of as it would release dangerous levels of radioactivity for many thousands of years into the future.

There were a number of scientific groups including Lockheed scientists in the USA that had previously worked out how lasers could provide the heat energy required to initiate a controlled fusion of hydrogen molecules to produce helium, i.e., the fusion nuclear reactor system. However, they were not able to develop containers which could hold this amount of heat energy. The development of stronger mineral products to withstand this amount of heat by British and French Chemical Engineers and the concept of a donut shaped system of containment finally enabled this first fusion power station to commence being built. However, this first reactor was only two thirds complete by 2039. Every effort was made to complete it within the next two years so that its energy would be

used to convert the large oil reservoirs that Norway had wisely retained for future use as the rich source of carbon to make the nutrient component of the future foods.

Eli also let Donald know that the USA had also built such a nuclear fusion power station in the Adirondack reserve in upper New York state, away from any high population areas. There was still a concern of an explosion if something went wrong. It was completed in the early 2040s. The USA had to import coal, oil and gas from large sources found in Canada, Mexico and Brazil to turn into nutrient chemicals, as it had basically exhausted all its own supplies. Subsequently a number of these fusion nuclear power stations had been built near sea shores though well above potential sea rise levels yet near enough to be able to use the sea water as a coolant. Australia still had large reserves of coal and gas and was also planning to build such a reactor so it also could begin changing its coal and gas supplies into the essential organic nutrients. Ironically it was one of the nations which had not yet mined all its fossil fuel resources which they were now able to sell for conversion to food, becoming very wealthy in the process. There were already other ways to make artificial meat protein and many other lipid and carbohydrate nutrients from particular plants. However, global warming was already seriously affecting the cultivation of these plant species. However, Eli explained that in the meantime, it was too late to help many of the western European humans to survive. More than half their populations died as a result of a combination of starvation, catastrophic weather events, and the rapidly increasing plaques of viral and bacterial diseases which attacked their malnourished bodies. The 4 metre sea level rises just about destroyed Bangladesh as a place to live, as well as many of the flat islands in all the oceans. Millions of the local populations did not survive these disasters. The huge dykes in the Netherlands were being increased in size, though suffered frequent breakthroughs by extraordinary sea swells. The residents of Venice were having to vacate their once famous city. The normal sea levels had reached two metres depth in St Mark's square and were rising. And the whole city began to sink at an increased rate into the mud that their multi-storied residences were built on. Eli explained that he also had to move from his lower downtown New York officed once the sea levels rose as had many businesses and residents. His officed soon had 2 metres of sea water in them. That was when he decided to move to the Janes Hill area, the highest part of long island. Huge migrations of populations were being reported around the globe, though with much friction between nations as not many were willing to increase the numbers of residents that all needed increasing levels of support. The world population had reduced by around three billion by the end of the 2040s. Many humans now came to believe that this may be the end of the world, or at least of human existence on this planet. Would our planet also end up like Mars

and Venus, as what we call dead planets. Scientists had deduced from the available evidence that these planets once had large amounts of water on their surfaces, with possible early life forms developing. Now dust only remained on their surfaces, with atmospheres comprising mainly CO^2.

Donald was at last starting to grasp the reality that the world had changed drastically while he endured his long sleep. He could hardly believe that all this could happen so quickly and result in so much change, yet that he had survived it all. He realized that he had Eli to thank for this. Eli in turn began to realize that he had better delay relating the next tragic decade of history until after Donald's cancer treatment, as this information was really starting to greatly impact on his client. He made an excuse of having a severe cold and being unable to turn up for the next weekly appointment. Meanwhile Donald's physical regeneration had been successful, and he was advised that he would be transferred to the health centre to have his cancer controlled. Again, he was placed in a cocoon and transported to what seemed a rather small building. It was nearer the edge of the dome and he could see outside through some transparent sections near the rim of the dome what looked like a few scraggly plants within a large area of bare soil. He thought he could see large numbers of humans or robots with guns outside the dome.

However as soon as Donald entered the Health Centre, his intensive treatment started. He was advised that no visitors would be permitted until at least two months of treatment had been completed. His reaction to this news led him to be immediately sedated. His body was subjected to totally new types of radio and chemotherapy. Fortunately, no surgery was involved as this usually resulted in the male becoming impotent sexually. This treatment went on for three weeks. He felt so groggy and unwell that he could not have cared about anything. It was in the fourth week that he began to feel slightly better. Then they began the stem cell regeneration of the many organs in his body that had been damaged. Yet again he was highly sedated for another month. However, after that time he was suddenly feeling that he had been restored to his old self and his mind again turned to wanting to find out more about the changes he was increasingly aware of. He was allowed to have a visit from Eli. Donald was desperate to know what happened in the 2050s.

Eli pointed out that the pace of global warming had steadily increased during the 2040s into the 2050s, and the results in terms of species extinction were enormous. The destruction of most of the plankton and shrimp species had severely disrupt the cycle of survival of ocean species. The baleen whales were the first to become extinct. However, as plankton and shrimp were the base of the food chain for most sea creatures, many other species also died out. During the early 2050s the temperatures now soared to 5.8^{o}C above the 1700CE levels. As had been predicted by

many climate scientists, at this temperature many of the large flora, the trees, began to die. The tropical rain forests were the first to suffer with most species dying, particularly affecting the Amazon rainforests and those in southeast Asia and the Congo region in Africa. Even the large conifer, beech and fir forests of the polar regions were beginning to be affected. These together had produced about 30% of the Earth's oxygen needs for living species to survive. There were concerns from humans world wide that this might reduce the levels of oxygen in the atmosphere making it difficult to breath. However leading climate scientists assured all governments that within the 100 Km depth of atmosphere covering the earth, there had been such a strong accumulation of supplies over the last few millennia that the loss of this input would not in current lifetimes make a significant impact to the 21% normal concentrations. However, they did point out that all the rotting vegetation would release enormous amounts of CO^2 and methane and other gases into the atmosphere, greatly increasing the amounts of these into the atmosphere. This in turn would create even more ferocious weather patterns. Winds of up to 300kM /hour were forecast to become a common reality, with even larger hailstones.

The production of hydrogen gas by breaking down water, resulting in the release of oxygen, had by now became the norm for factories. Eli explained to Donald that the green power supplies were greatly diminished as a result of the constant deep cloud cover greatly reducing solar power electricity generation. Even the wind generators were very susceptible to damage from the wild weather, though many continued to remain functional.

There were so many plane crashes due to catastrophic storms that few humans were prepared to risk flying. Some companies tried regenerating the hydrogen or helium containing dirigible airships, though these could not survive the ferocious weather events. The remaining shipping companies were quickly building ships with huge protective covers which ensured that any heavy deposits of large hailstones would not build up on the decks. These were overlaid with tough glass covered solar panels to generate electricity. Many of the new ships also had sails installed which were made of a newly invented solar electricity generating material. They all had electric motors installed to replace the old diesel models, so needed stores of the latest batteries to help keep them going, especially when the winds were low. However, they still had unexpected periods of ferocious windstorms and hail to deal with, so sailing was not for the faint hearted. Fortunately, these storms could then be more accurately forecast, which enabled the ships to quickly wind their sails in and protect them with a new hail resistant type of material. It was greatly appreciated that there were enough humans, both male and female who were willing to take the risks involved as staff in helping these large ships continue as the main form of

transport between countries.

Eli then explained that during the 2050s, the CO^2 levels in the atmosphere went gangbusters. All the rotting vegetation which once absorbed CO^2 from the atmosphere was now pouring it and methane back into the air. Eli tried to explain that the concentrations of CO^2 were then no longer measured in ppms, but in percentages. It now comprised at least 8-9% of atmospheric gases. 'What about the domes', he queried. 'Ahh, yes. Well, that is an interesting story', Eli stated. 'During the late 2030s, the large glass company in Australia that had developed the carbon fibre/mineral shatter resistant glass, had also been experimenting with building large dome shaped hot houses to replace the sheet glass variety that had been used for so long by market gardeners. Their invention of this carbon fibre and mineral reinforced glass had led them to believe that they could develop a greatly enlarged version of the glass blowing system used to make so many rounded glass containers. It took many years to finally be able to produce a large hemispheric bubble of glass around 300 metres in diameter, 50 metres in height with the glass around 5cms thick. Fortunately, Australia had large deposits of sand available to provide for the manufacture of such huge domes of glass. The increasing sea levels were covering over much of the coastal sands, though the large amounts of desert sands were now being mined.

These large domes were initially intended for use by market gardeners, to replace the sheet glass buildings. They had hooks attached which allowed them to be taken by helicopter to where they were needed. However, such transport was only viable within a round 50 mile radius of where they were manufactured, and in good weather. There was a request from many overseas companies to be allowed to manufacture such domes, so subsidiary companies were set up in most of the more industrialised countries.

However, by the late 2040s, because of the inability for humans to survive these ferocious storms, which now were so frequent, and the intense heat waves, as well as the rising sea levels, a number of governments realized these reinforced glass domes could also provide safe places for residents to live in to escape these changed weather and climate conditions. The companies found they could join units together to end up with modular domed structures covering very large areas. To join the individual domes together, they were able to use a new type of welding equipment which was electrically powered to produce lasers. These could cut through the glass and weld the units together to produce an airtight mass of units. Many communities in the wealthier countries ordered these to be constructed and installed just outside the old large cities and towns, many now being invaded by rising seas, so surviving communities could move into these protected environments. Eli pointed out that the

New York Governor had agreed to one such domed structure being built on the highest part of Long Island which just happened to include the cryostat station.

Fortunately, by the mid 2040s, a Finnish company had invented a chemical based filtering system which quite efficiently purified air by using enormous suction machines which transported air through specialized chemical filters. These were large, cumbersome machines which had two types of filtering systems, one containing slaked lime (CaO) which when water was added reacted with CO^2 to form a type of chalk and the second contained high molecular weight hydrocarbon oils in which methane readily dissolved. While these machines could initially make little impact on the levels of these greenhouse gasses in the atmosphere at that time, they were ideal for use in these domed structures to clean the air of the human expelled CO^2 and methane.

Even though the individual domes were only 300 metres in circumference, these modular units were able to eventually cover areas of around five miles (around 8Km) or greater in diameter. The outside rims were embedded to a two metre depth into the earth. Large hooks were present on the sides of the external domes to which were hooked thick steel wire ropes which were in turn embedded in enormous concrete filled holes in the ground. These ensured that extreme winds and especially hurricanes would not shift the domes. The joins between modules had been designed to allow rainwater to be collected into large underground tanks in various localities within the village. The water had to be filtered to remove the large amounts of dust which were raised from the desolate earth by the huge dust storms which were now a common event. And it now rained more frequently.

Eli explained that the series of domes they were living under had been bought by New York state in the late 2040s to accommodate those having to flee the lower areas of New York city which were increasingly inundated by sea water. Jane's Hill domed village was the largest in their state, though four others were also developed, one each near Albany and Rochester, and one each in the middle of the old Connecticut and New Jersey states. Electricity was supplied from the large fusion power station in the Adirondacks and was in plentiful supply. Fortunately, it had been decided to place the power lines underground.

The temperatures within the domes were controlled to exclude the excess heat, though varied to ensure they represented a moderated diversity of those temperatures produced by the seasons. The air was continually purified using the Finish filter system. Eli explained that he had applied to move into this dome when his Office in downtown New York was beginning to go under water. He had first moved into the increasingly popular Jane's Hill village, then had purchased an accommodation unit under the dome. A branch of the New York Bank of the Future,

that bank holding Donald's funds, had also moved there. The then current Mayor of the Jane's Hill village, he explained, was the main agitator to have this dome village set up in a large vacant area next to the original Jane's Hill village.

After a few accidents causing damage to the domes, it was soon realized that the residents would have to agree to certain requirements before they were accepted to live there. These included that no guns were allowed within the village itself in case accidental bullets caused holes in the glass dome. All guns had to be stored in well guarded enclosures just outside the glass dome and used only to defend the village if required. Another rule was that no smoking or vaping, or use of natural gas burners, or any fires that produced soot were allowed, due to the fact that they all provided some degree of pollution of the closed air space and could damage the filters. The council also had a very efficient fire-fighting station established as the smoke and soot from any fires would blacken the dome near where the fire occurred. Fortunately, with very few combustible materials used in construction of the AUs, there had so far never been a fire in this domed village.

Eli stressed that the domed villages were an emergency survival project and that all the accommodation units (AUs) were the same size and structure and fixed price to purchase. Their main purpose was to provide shelter from the increasingly destructive weather, and from the increased heat, and from the rising sea levels. These domes became so popular that subsidiary companies around the world were inundated with orders. They used desert sands to produce these units to requested sizes. Saudi Arabia now made lots of money selling sand when hardly anyone wanted its oil any more, except to make food out of it. The largest dome manufacturing company in the USA was located in Detroit, near the great lakes, with another nearby in New Jersey. Huge helicopters supplied by battery electricity could lift these domes a considerable distance to where they were needed.

Donald could hardly believe he was now living in one of these. It seemed that luck was again on his side. In fact, he realized that he was so lucky that the cryostat unit just happened to be enclosed within this dome. Eli assured him that even if it hadn't been, he would have ensured that on release from the unit, Donald would have been immediately transferred to the domed village. He had booked a place for Donald in advance. That was what he was paid to ensure. Even so, Donald realized how lucky he had been with all the plans working so far, though again realizing he had Eli to thank for most of his good fortune.

Eli was keen to let Donald know that life in the poorer countries was becoming more and more difficult to sustain. People were dying at such a fast rate that electric trucks were cycling around communities to collect the dead in the same way as had happened hundreds of years earlier during the dreaded plaques. No one had the

energy to bury even their close relatives. Food crops were increasingly difficult to grow, though there were a few species of plants that seemed to be able to survive and thrive. Eli pointed out that communication was still working, though not as efficiently as pre climate change. The enormous regular storms produced constant lightening which frequently interrupted signals. By now almost everyone in the more industrialized countries had an arm phone attached which would give them the latest news. This attachment was also their computer, governed their daily routines, provided some entertainment and enabled them to keep in touch with their relatives and friends, as well as monitoring their own body health. The AI systems which it was expected would help humans work out how to survive such a range of changes proved to be not able to deal with many of the new complex new conditions, though were still very helpful in aiding communication and function of many of the new devices.

Eli continued to report that sadly, in the great confusion caused by these dramatic climate events, many Governments collapsed. In some it was agreed to form a common government representing all parties as an emergency management system, as happened often during major wars. Survival of as many of the population as they could manage was their main priority, ensuring their residents had at least some food, water and shelter. This was no time for politics. The UN still tried its hardest to find out which countries were having the greatest difficulties with survival and was able to provide some help though with extreme food shortages and difficulty in transporting supplies, this was relatively ineffectual.

Religious belief had suffered greatly during this period of crisis. The devout believers had organized prayer meetings almost continuously requesting their Gods, whether it be God or Jehovah or Allah or Bramah or Krishnu, to intervene and control these rapid climate changes, though He or They just did not seem to be willing to help in any way. The climate just got progressively worse. The more fundamentalist believers felt that this must be punishment by their God for the increasing amoral state within some countries, and that their God had forsaken them. This was particularly so in the USA. Large numbers of people just gave up on God, believing He or They had deserted them. In the crisis where survival became the primary focus, many people just locked themselves in their houses or AUs and only ventured out to obtain food and other essentials for survival. The churches and temples and synagogues and mosques became progressively empty. Many of the residents living in these domes had a revival of religious belief, believing their God had saved them. The more devout attempted to retain some of their most important rituals in their AUs.

Another problem which was also expected was that certain viruses had just about wiped out whole communities. The increased levels of heat combined with

severe malnutrition had left so many humans in such a depleted state of health that they were very susceptible to such inflammatory viral and bacterial diseases. As well, the production of therapeutic drugs had slowed greatly, as it was increasingly difficult to obtain many of their components. This had resulted in a greatly increased death rate in those humans with chronic diseases. Even so, the difficulties in exporting or importing any items was having a great impact on all countries.

Ch 4. Settling Donald into a domed community

It was now well into 2065. Donald's treatment had been successfully completed, so Eli arranged a number of sessions to help him settle into an independent lifestyle within the Jane's Hill domed community Village. As older residents were dying, their AUs became available. Eli had arranged the purchase of an AU in an area near a small park with a golf practice net close by. Obviously, there were no room for golf courses in any of the domed communities anywhere. However one could play virtual reality golf, which was a sad replacement for the game, though had inbuilt multiple exercise routines while the imaginary game was being played.

He had also purchased two robots, a male and female unit, to help look after Donald's needs, as well as an arm phone which was attached to his left arm. This latter item was essential to help him find out what was happening not only in his own body but also in his domed community as well as globally. It also reminded him of any appointments and enabled him to ask any questions he needed answers for. It was necessary for Donald to have regular checks to ensure his cancer had been totally beaten and his overall health was maintained. As for the robots, they had by now become a regular requirement for any household so long as a resident could afford them. And they did make life so much simpler. 'By the way', Eli said, 'I need you to know first up that the male robot plugs itself into the grid at 1AM and the female at 3AM each day for two hours to recharge their batteries. They will be unavailable at these times'.

He purchased a transport capsule and spent a considerable time training Donald in how to program it. Just in case Donald wanted to explore outside the dome, he purchased an electric car, though he warned Donald that he would need a lot of instruction in how to survive outside the dome. It was not a safe place, with many people who had lost their homes now desperate to come to live there and they could become fairly aggressive. However, each domed community had a maximum population policy, for obvious reasons, and Jane's Hill domed community was already at that level.

Donald was very appreciative of the plans Eli had worked out to enable him to live an independent life within the community. However, he was not sure he needed two robots to look after his needs. He had observed that to eat, all that was possible was to get your food from these cylindrical units which were in every AU. He asked were there supermarkets where he could buy meat and vegetables. Eli advised that with the decline in farming, it was no longer possible to get fruit and vegetables and meat and milk as we knew them. Even in the USA the desperate requirement for food resulted in the need to convert the rich carbon sources such as coal, oil and natural gas to the basic proteins, lipids, carbohydrates, vitamins and electrolytes using the

nuclear power which was increasingly available at that time. And the chemical engineers had long ago determined which chemical mixes provided the old tastes that we longed for to add to these basic nutrients.

Eli explained that he had two robots and found they made life so much easier to manage in their restricted lifestyles within the village. The role of the male robot was to ensure these basic food supplies were maintained, that the unit was kept clean, and that he was kept safe at all times. The role of the female robot was to look after the finances, make his bed and wash him and his clothes, and be available for company, even to be available for sexual advances whenever he felt the need. However, Donald was alarmed at this latter idea. 'Sex with a robot. How appalling to think of it', he retorted. Yet Eli continued, 'Donald, you will find most of the women in this Village will not want to have a sexual relationship with you. Do you remember before you were frozen, how in Japan and South Korea and to a lesser extent in China the young female women were increasingly not wanting to become 'the slaves of men' as they put it and refused to form a relationship with any man. Well into the 2020s there were two brothers named Tate who strongly promoted a form of masculinity which advocated treating women as slaves to a man's every wish and this concept gained traction with those less intelligent young men and boys. Sadly, they influenced many of these low intelligent males to adopt such practices so that most intelligent young or old women decided they would never want to start up a new relationship with a male. These 'macho' males could be very charming as all psychopaths are, though once they got you in their grasp, the true nature of their actions was quickly exposed. Sadly, they conned some of the low intelligent girls to be their slaves, though such relationships resulted in such serious domestic violence, with many young women killed by these so called 'macho', yet cowardly men. It quickly became evident that these 'machos' were really strong cowards and crumbled when confronted by intelligent strong men. This standoff between the genders spread rapidly and became even more widespread once the climate crises made everything about normal life questioned and desperate. Eli carried on saying he realized Donald had been divorced for many years in his earlier life. However, he said, 'you will find you are now a retired man and will become increasingly relaxed. You may have your sexual drives return. While not quite up to the original sexual experience, you will find the robots these days have such lifelike replicas of the female sex organs and are so submissive and sexually alluring that you will most likely succumb to their advances. I have regular sex with my female robot' he reported. Donald was not so sure. Eli went on to explain that male robots also had very good replicas of human male sex organs and could likewise offer sex to their female owners if requested. Donald considered this almost unimafinable.

Eli continued, ‘You should know that the production of offspring is now mostly achieved by artificial methods, using sperm and ova from young donors. The ova are artificially inseminated, and the embryos are placed in artificial uteruses within a very carefully controlled tissue culture system, in a totally aseptic environment. Where there were heterosexual couples wanting a baby though not one born naturally, the same services were made available. During the 2050s, so many women were refusing to have children born naturally that special ‘artificial uterus nursery clinics’ were formed which allowed human babies to be grown in this way. This process is now the norm, though has been greatly refined to try to replicate the mother’s presence during the 9 months of foetal incubation. Donald could only think, how things have changed.

In fact, so many things had changed over the preceding 40 years, Donald wondered if he was still living in the USA, and if so, was there still a President and Congress running the show. Eli assured him he still lived in the USA, though that the system of government had drastically changed. It was in the year 2050 that the then President had to declare an extreme state of emergency and dissolve the Congress. He stated that, according to the advice he had received from scientific experts, the potential for individual human survival had now reached a very low level. It was essential for all members of both the House of Representatives and Senate to return to their homes and do whatever they could to help as many of their families and others in their States to survive. He also asked the armed forces and public servants to return to their homes and try to help save as many Americans as they could. The threat of increasing numbers of refugees both from the oceans and from the southern countries has dried up as transport and obtaining food and surviving in the open were now almost impossible. It was now not possible for the central government to do more than to recommend all remaining humans try to survive as small groups which all helped each other.

The President stressed that there would still be a few independent Public Servants who had volunteered to stay in Washington and who were tasked with overseeing the supply of resources to help survival wherever requested. They would coordinate the provision of the new artificial food production and distribution and organize for the supply of safe drinking water to be made available where desperately needed. However, he advised that the number of states would be reduced to 15 by temporarily aligning the smaller states with the larger, with a Governor in charge of each group. This Governor had final control over funding all emergency requests. However, all administrative matters were now under survival emergency mode. Each village had its Mayor and those in each regional state group were under the control of a regional governor, elected by these Mayors. There would be no overall American

President for the foreseeable future. Eli pointed out that it was now impossible to retain the democratic elections for any major political positions anywhere in the world. However, within their village, elections for the Mayoral position and councillors had been held with voluntary voting using the arm phones, though the present Mayor was so good, she had been continually elected to this position for around 30 years, even before the village moved into the domes.

However, the President had stated that each new State group would have a centrally located Department for Emergency Survival. To short cut time for action, the Head of this Department in each State group had the power to approve emergency requests from within their state and would have considerable funds at his or her disposal to assist requests for aid. He added that each new state would continue to retain its meteorological unit which would be required to inform all residents of the state of the weather on a daily basis. Eli pointed out that they were still part of the old New York State her though New Jersey and Connecticut were now amalgamated with NY State and were together called Lower North East state. In the new Lower North East state, a Department for Emergency Survival (DES) was established and located in a higher level of old New York city. It had approved the order for the domes they were living under.

Eli reminded Donald that the population of each of the original states had greatly declined. The overall population in the USA was considered to have declined to a quarter of the original 250 million. Donald was shattered by this statement. He enquired about the situation within New York City. Eli advised him that with a four metre rise in see levels and frequent wild weather, many of its streets were under water and much of the lower area was now not habitable. Most of the population had fled onto higher ground inland, though many of the poorer residents were still trying to survive in the tall residential buildings. How did they survive? Eli explained that some still manufactured clothing in these buildings from those items left behind by those who fled, and they were able to survive by internal trading. Nominated residents collected the food supplies sold now from Government depots on the mainland, and they had been able to purchase some of the reverse osmosis machines that moved the salt from sea water.

Donald asked how many residents were left of the original 20 million inhabitants of this once great city? Eli replied that no one knows though possibly only around 50,000. Where did they all go? Around half perished from the many new viral infections, through water pollution and shortages, starvation, and the number of armed gangs that immediately formed that would kill anyone who had food or other resources and steal them. Law and order had broken down for some time during the late 2040s, though was re-established by militias who eventually controlled the

gangs, though it took many major gun battles to achieve their overthrow. The remaining gangs fled into the forests on Long Island or on the mainland. Many thousands of former residents had been killed in these skirmishes. 'Wow', said Donald, 'and I was asleep while all this was happening'. Eli agreed he was the lucky one.

Eli explained that large numbers fled the states bordering the oceans on the electric trains that were still working and travelled inland to the larger cities which had fresh water supplies and some food supplies still available. Many of these had established multiple domed villages, entry to which was in high demand to all bidders. Many of the poorer residents of these towns had moved onto the abandoned farms or had dug underground homes on the sides of high hills, where at least they were protected from the weather, especially the extremely destructive tornadoes which were now so frequent. They used large batteries to supply electricity which they generated through solar and wind power.

Many had constructed large ponds to grow heat resistant algae. These ponds were covered by a thick though transparent, thin clear reinforced glass material which allowed some level of photosynthesis of the CO^2 in the air to take place, resulting in the production of some oxygen. Other food supplies were brought in by travelling salespeople, and each group of residents was able to trade either work or goods to help them survive. All the survivors displayed that remarkable resilience of the human species. Donald could only wag his head in wonderment at this information. Eli had worked out from the information he gained from his arm communicator that the other domed villas were relatively organized in the same way as theirs. Entry to all domed village was highly controlled by heavily armed police and militias.

Donald decided it was time to explore his new village. He asked Eli should he buy some guns as he had always had some in his pre cryostat days. Eli reminded him that guns were not allowed in the domed villages as even an accidental bullet could severely damage the reinforced glass dome, and such damage was very difficult to repair. Guns had to be stored near the village exits and were only available if one was travelling outside the Village. 'How safe am I travelling around the village?', he asked. Eli pointed out that under the state of emergency they were all under, crime in the villages was almost totally eliminated. There were a few police whose main task was to help people cope with unfortunate events, and who help keep the few adolescents under control by providing a number of sporting outlets to help them meet together and keep them occupied. Of course, there was a school for the children in the village though with survival as the number one priority over the last few decades, few people wanted children. Eli pointed out that the village Council employed many of its

residents to become an armed militia to spread out and patrol within a few miles of the village to ensure no vagrants or gangs with guns could damage the glass cover.

It took some time for this new way of doing things to settle in Donald's mind. It also took some time for him to work out how to program his travel cocoon capsule. It had a dashboard map of the village, and the old fashioned digital positioning device still worked to help him locate where he was. Yes, the satellites which controlled these were still operational. He spent some time practicing as he had to pass a driving test before he was allowed to operate one in the domed village. Eventually he was successful.

He gradually expanded his area of travel until he came to what seemed the equivalent of a shopping area. However, there were no supermarkets, no large emporiums which sold huge varieties of clothes, etc. The few shops only stocked the essentials for survival when these could be obtained. There were multiple health centres, and the equivalent of pharmacies. He noted a dental surgery, though as Eli later explained, with their new diets, teeth no longer rotted from the high sugar levels in their earlier refined sugar diets. Also, all soft drinks were artificially sweetened.

There were a few physiotherapists and some alternative medicine clinics. And of course, there were still cafes though with the trade in real coffee and tea now almost impossible, there were many substitutes which he found still tasted like the real item. It had even become impossible to obtain the cola drink basic components, though the chemists had soon manufactured similar tasting substitutes in their factories to help keep supplies manufactured. There were a few items on the shelves which pretended to be cakes and biscuits. He tried one and it tasted like a cake though was so solid, it was hard to digest. Obviously, the few bakers left had not yet been able to replicate the old skills of making light, spongy cakes from the artificial ingredients available. No wonder there were no bakery shops present. And as Eli had advised him, the USA money units remained the same as they had been 40 years ago, though what they could purchase was very different.

He also noted that in the centre of the village was a small square with gardens containing some of his old favourite flowers. Someone had brought some packets of seeds into the village and many residents loved to come and sit in the park seats to just remember some of the good things of the past. Donald had also noted that many AUs had some pots of flowers near their entrance. Again, a reminder of the past.

He was pleased to see a branch of his old bank, the New York Bank of the Future, which was a relatively small bank though he had found very reliable and cautious with investors funds and were frequently in contact with depositors and investors to inform them of any major changes in the money market. Luckily, it had survived all the catastrophic years. Eli had advised him that most of the big banks had

not survived. He went in to meet the manager who was also in her 60s and he was made very welcome. Of course, the fact that they had some millions of his dollars in their vaults had an impact. Eli had kept a constant check to ensure his money was making a good level of interest, though had let Donald know that all the banks went through tough periods after each climate catastrophe and there were runs on the banks as desperate Americans feared for the safety of their deposits, as well as their own survival. His bank had engendered such loyalty and confidence by their customers that this did not happen to them.

Donald was fascinated to see what looked like a real estate agent and went inside to meet the proprietor. Unfortunately, the first staff he met were all robots, though a human male seemed in charge. And he appeared to be around the same age as Donald. He introduced himself to the man who said, 'Ahh, you are one of the humans who was released from the cryostat. You must be 100 years old by now, though don't look that old'. Donald grunted. 'By the way, my name is Josh. How are you finding modern life?' Donald explained that he could hardly believe the changes that had taken place over that 40 years when he was frozen. He asked what the role of the estate agent was in this village, how greatly had it changed, and did he own the business?

Josh laughed as he let Donald know that under the 'state of emergency' legislation to handle the survival crisis all matters relating to accommodation were controlled by the local Council. The Mayor was then responsible to the new State Governor, though few matters ever needed to go further than the Council. Josh explained that he was the Manager only of the business, and his responsibility was to deal with vacancies and swaps in accommodation. On the death of a resident one of the many aspiring applicants from the outside who must be a US citizen would be chosen to occupy the vacated unit. Each applicant was strongly vetted, to ensure they would fit into the local community. One thing they would not tolerate in the village was illicit drug use. Any resident found to be using them was immediately evicted. He explained that his job was not onerous. He also had to deal with complaints and grievances, which were not common. Josh indicated that pet dogs and cats were allowed, though with such high density living there were strict rules to ensure the pets were kept inside and quiet most of the time. However, finding food for them was very difficult and expensive.

Donald was keen to find out where the central administration for the village was located as he had not come across it yet. Josh said he would take him there and introduce him to the officials. They would be very keen to meet Donald, as the 'good old days' were often a major point of discussion. Donald was not sure he wanted to talk about those days though was keen to meet the Mayor and village council officers.

Josh had a four-seater cocoon capsule, so they went to the other side of the village to the council chambers. These were not in the great and elaborate buildings he would have expected, only a large set of multiple AUs similar to his own. He was introduced to the female Mayor who took him to meet the CEO and other council officers. He was a source of curiosity for all. There were three other residents in the village who had been cryostated though not for as long as Donald was. They were all surprised that he did not look much older than the Mayor who was also in her early sixties. He was treated as a celebrity and invited to visit them often so they could find out more about life over 40 years ago.

The Mayor was keen for him to see the community centre where all residents were able to come to play snooker or table tennis, or badminton, or indoor bolls, or play the many forms of card or board games that were available. There were many residents there though the Mayor said they were the usuals and that she was concerned that so many residents in the village just kept to themselves in their AUs, still seeming to be in a state of shock and feeling very vulnerable. And her major concern was that so few babies were born. She told Donald she was drawing up plans to do something to change the state of inertia the village seemed to have succumbed to. The Mayor advised Donald as one of the oldest residents that she would contact him soon re helping with this process. He was a little shocked though politely said thankyou and made out that he had to meet his friend Josh.

When Donald and Josh returned from the Council visit, he continued his journey and found certain areas where small factories still operated. They held a variety of businesses such as making clothes out of artificially manufactured textiles, or storage of the basic elements of the food supplies or contained the spare parts for all repairs of the infrastructure. One large building was the centre for robot storage, programming and sales. He entered and was advised that the robots were actually manufactured in a large factory in New Jersey and delivered in large electric trucks around the state.

Another large building received all the waste, which was regularly still collected by large electric trucks, though which was electrically incinerated outside the domes after all recyclable materials had been retrieved. He had noted that his male robot regularly placed all their waste in containers which were regularly collected. At least, this tradition has not changed greatly, he thought. These waste depots were located near the outer walls of the domed structures, particularly near the large double structured entry doors. He was fascinated to see the large electric trucks enter and leave through these doors. He managed to get a glimpse of what lay outside through a number of transparent segments, and it did not look very healthy. There were few plants though there were roads for the electric trucks and cars to travel between

villages. At one point he could just make out the decrepit remains of the old village houses in the distance. Once he felt more at home in the village, he decided he would like to explore outside the dome.

Again, Eli advised him not to do so as there were desperate vagrants everywhere with guns though most had joined gangs. Volunteer militias tried to capture as many as they could and send them to a supervised retention centre in upper New York, though their numbers seemed to be mostly deep in the forests away from the village. Donald was advised that the supply trucks all had to have armed escorts, though some of these did take passengers into the old New York city. This led him to a deep desire to see some of his old haunts, but not just yet. In the meantime, the golf practice range and a club where he could play virtual golf were found in his travels around the village. Also, he found a cinema which played many of the old films. This allowed him to meet some of the real humans who made the village home and he gradually made some good friends especially of the older aged residents.

Donald had noticed that there were no buildings to worship the various Gods of the different religions. He asked Eli why and was reminded that since the heat and weather became too bad in the late 2040s and 50s, hardly anyone attended a church or equivalent. They were so scared to go out and just stayed indoors except to obtain food. Many of their friends and relative had died, and they did not want to risk mingling or suffering heat stroke or catching a virus or being caught by the gangs. However, he was aware that some residents had retained a strong religious faith and had welcomed other like-minded residents to their AUs to celebrate their beliefs.

Meanwhile at home, Donald was quickly getting used to having the two robots do almost everything for him and finding some companionship of a sort with them. They were totally devoted to helping him and he learned to trust them to do the right thing by him. They wore clothes like humans. Their vocabulary was extensive though limited. He had especially come to enjoy having the female robot disrobe so she could come into the shower with him to scrub his back and other parts. And yes, as Eli had explained, she had the most beautiful human looking breasts, and her skin was the same colour and texture as a slightly tanned female human skin might be. She had a human-like mouth with sparkling white teeth, a human-like tongue and reddish lips which could smile. He also noted a very human like vagina partially hidden under pubic hairs, though no sign of an anus. They have thought of everything, he mused to himself.

He soon realized that he could not help developing an erection on such occasions especially when she was washing his genitals, and her beautiful breasts floated around in front of him. The robot also noticed this and advised him that she was available for sex anytime he wanted, day or night, except when she was being

recharged. It did not take long for her invitation to be accepted, and he could hardly believe how good it was. She would do anything he requested, and she felt so human, even seeming to enjoy the sex though he knew she had no emotional input. He felt like a young man again, and soon he could not get enough of it. He realized he had been bottling up his sexual drives for so many years and now he was just releasing them all at once. And knowing it was with a devoted robot who had limited emotional reactions allowed him to really let go and do whatever he felt like. He wondered how she kept her vagina clean, though noticed that she had a shower after every event and removed a condom like structure from her vaginal region which she discarded, replacing it with a new one. She always was meticulous with hygiene and smelt very womanly. He could hardly believe the manufacture of robots had come so far in 40 years, remembering the crude models first developed before 2024.

However, it was not long before his age caught up with him. He became so exhausted that he had to cut down such enjoyments to only a few times each week. Fortunately, the brilliant designers of these modern robots made sure that the AI used in their programming led them to expect such changes and his female robot, whom he loved to call ‘Foxy’, showed no signs of concern when this happened. He had to admit that he had really grown very fond of her, which he knew was ridiculous. However, he also knew how much he enjoyed the sex she provided and the effect it had on him.

In fact, he realized he was enjoying life in the village very much more than he had ever been able to up to 2024. He had never felt so relaxed. Sure, he was living in an artificially protected environment and on his accumulated finances, though not having to worry about anything was such a change to the early 2000s when he felt he had to plan everything so comprehensively, was always stressed to the limit, and always having to be vigilant against house invasions by thugs with guns. He realized he owed much of his present situation to Eli, whom he had come to regarded as his best and closest friend. They met every week for coffee and a chat so as to know how everything was working out. Eli kept telling him not to thank him for it all, as he had been well paid to do so, having recently drawn a million dollars from Donald’s bank account. However, Donald could not help doing so. He just could not believe how lucky he had been to end up in such a haven.

Ch 5: Donald is summonsed by the Mayor.

It was early in 2066 when the Mayor contacted Donald and asked him to come and speak with her. She advised that she was setting up a special consultative group to help her and the Council plan the way ahead. She felt that it was time the residents of the village began to plan ways to move beyond immediate survival mode. He was asked if he would be willing to be on the select advisory group, as she believed his knowledge of what life had been like before the major climate changes had occurred would be useful knowledge. Donald felt that Eli would be a more appropriate choice, though the Mayor said he had a much longer view of their early history.

Donald knew that he had not been the type of person who had been very active in community events, though was extremely honoured to be asked. He agreed. His level of gratitude to be living in such a relaxed environment had brough to the surface a change in his previous very competitive approach to living. He was so grateful to be able to live his remaining years is such a safe environment, and felt he needed to contribute to its continuing function, to help provide support to benefit others for a change. He agreed to be part of the Future Planning group.

However, the request suddenly made him aware that he was also not very knowledgeable about how their current community operated. He requested permission to have meetings with the various council staff to find out more. How many human residents did the dome community have living in it? What were the male/female and age ratios? How many children were there under 15 and what were their male/female ratios? How many residents were employed by the Council or other governmental agencies, and how many had private business operating? What was the range of incomes? How did the village financial systems work?

Donald found that the population limit for the Village was currently 35,000 human residents. This comprised 40% males, 46 % females and there was a new gender category of 14% that was fully recognized and supported, which included transverse and homosexual humans. He remembered the times when such groups struggled to gain any recognition or support, and he had not been one to support them. How had the very religious groups come to accept such anomalies? Then he remembered that religion no longer played such a dominating role for the current residents, most of whom were just focused on surviving, compared to that in the 2020s.

He was surprised that there were not more residents in the Village though realized that even though there were 28,000 AUs, they were very small and most housed only one resident. It had seemed that the urge for survival was so strong at the individual level, that many residents preferred to live by themselves. He found

that there was a section of the village where some of the old style families lived, though they had no more than two children each. He found the age distribution of human residents included 40% over the age of 50, with only 700 children under the age of 15. 40 % of these were males and 42% designated themselves as females. Most humans had decided that it was too risky to bring more children into the world. Donald's old brain suddenly saw the consequences of such a situation. If these numbers of children were so few in all the village communities, this could result in the total demise of the human race. He was aware that he was unlikely to live more than 20 or even 30 years longer, as was the Mayor and many of the current residents. This number of children was not sufficient to replace the older segment, and after two to three generations, there would be hardly any humans remaining. It was obvious that the Mayor was very concerned for the future, in particular this lack of future progeny. Would there be a future for humans on this planet, or in fact for any living creatures including flora?

As to the remaining questions he had discussed with Council officials, he realized that most residents were employed by the Council. Many were employed as a militia. As he had been previously advised by Eli, they were provided with guns and other military equipment, and required to spread around the perimeter of the village for two miles in every direction to prevent any vagrants shooting holes in the Dome. He asked how do these vagrants survive? He was advised that many lived in small community groups, while others lived in gangs which ravaged the area between the domed villages, often moving into old houses that had been abandoned. They scavenged all the other old, abandoned homes to look for tinned foods, and had managed to capture enough trucks with supplies to survive. He could not help feeling a bit sorry for all these folks, including the gangs. What a struggle it must be to survive. He realized how lucky he had been and his whole attitude to these struggling poor had begun to change.

Of the remaining village population, many were employed as local police, as health care workers, in repairing infrastructure, in overseeing waste collection, and a few as teachers at the local school. How does the Council pay for all this, Donald queried. He was advised that all residents have to pay a tax. Eli had obviously organized this tax payment without him knowing. This was because he was aware of how the old Donald hated paying tax. Donald felt both ashamed and angry that his attorney had thought him so arrogant that he would not want to contribute something to the remarkable new lifestyle he was enjoying so much.

He asked Eli could he let him know just how much money he had in the bank and what tax he was paying. Eli advised that of the 30 million he had left in the bank in 2024, with currency devaluations, Eli's fees for 40 years and the expenditures to get

his cancer controlled and then get his organs all functional, then setting him up by purchasing an AU, robots, etc, there was now only 8 million left. However, Eli continued, ‘you are one of the richest residents in the village. However, no one knows that. You will have noticed that in this village everyone is treated the same. Every AU is the same irrespective of how wealthy a resident is. It is emergency survival accommodation. There is no wealthy and poor part of the village. This is one of the remarkable changes we have all been required to accept, though I think we all find it a good way to live.’ Eli went on to explain that the climate crisis had caused the majority of the rich to lose all their wealth. Most large banks had become bankrupt, the majority of investment and insurance companies had also collapsed, most real estate could not be sold, only a few like Donald had been lucky enough to have their banks remain solvent. The primary focus was and is on survival, for all individuals, rich or poor.

After taking it all in, Donald could only say, ‘Eli, I again cannot express my thanks enough to you for what you have done. I will be eternally thankful. What you have done has changed me in such a way I cannot understand, though living in this village has changed me greatly. It has forced me to realize what is most important in life, and it is not living just to make money.’ Eli was uncomfortable with such praise, though was so pleased to hear what Donald said. He was a rather unpleasant, self-centred, angry, competitive person to deal with in 2024. Eli realized that he, himself, also had changed, and was now himself also rather well off though also had a new respect for all human life. Though he also realized that his extensive self-education to try to understand why all this dramatic climate change had taken place had contributed to this change.

Chapter 6. A: The first consultation event.

The first meeting of the Future Planning Group saw them really get into the topic. The Mayor made an impressive introductory speech, pointing out that, without them changing many aspects of how they now lived, there was a great risk of most of the residents dying without leaving progeny and mechanisms to help keep the human race alive beyond the end of the century. Her understanding was that some of the measures that were being undertaken worldwide to combat climate change were starting to show sign of slowing the increase in average temperatures. She felt it was essential for the residents of their village to not only contribute to the survival of the human species in whatever way they could, but also begin to explore ways to enhance the quality of life they currently were forced to live. She proposed a sequence of discussions to explore ways this could be achieved.

The sequence she proposed was firstly, to determine where they considered they might be in terms of climate change, and how this had impacted on their lives. The second stage was to determine what type of future they all wanted, considering the constraints they were experiencing. She asked did they really want to return to the way it was in the early 2000s, looking at Donald to indicate that she would be relying on his comments during discussions on this topic. The third approach was to determine what measures the village should take to ensure survival of the human species while attaining and maintaining a good quality of life for all remaining humans, including those not fortunate enough to be living in domed villages. Wow, what a task we are being set, thought Donald. Though I have to agree with her 100%.

The Mayor proposed they form small groups to brainstorm on these topics, then report back for a whole group to attempt to bring all their proposals together. Donald's group included some impressive residents, including a former Harvard Professor of Biology. Sadly, all Universities had to close in 2050 when the general State of Emergency Survival was declared. Professor Hardinger was normally a basically quiet, reserved, introverted man, though as they would soon find out, he was regarded as one of the world's top molecular genetic researchers.

He was asked for his opinion as to where the planet was now in terms of climate change. He advised that as far as he could determine, the levels of CO^2 had exponentially exceeded the 500ppm that climate scientists had considered the limit before most of the systems that buffered its effect on climate would be exceeded and totally break down. It was now around 9% of the atmospheric gasses, well up from the 0.04% a century ago. Methane levels had greatly increased though he was not sure to what extent. This had resulted in the current average global temperatures being 6.8^{o}C.

However, with most farm animals dead or dying and a huge reduction in the

human population, as well as there being hardly any fossil fuels burnt any more, these factors should no longer contribute to increased temperatures. He pointed out that, however, many of the land and sea ice deposits were rapidly melting and still releasing large quantities of methane, though that the very large deposits of ice that were over a kilometre deep would still be melting for hundreds of years with a few more degrees in temperature. He explained that the sea borne ice shelves and the icebergs which fell from glaciers ending in the oceans would all displace the same volume of water as they would when melted, so would not add any extra to the sea levels when they did melt. It was the land borne ice that would influence the sea levels most, and these melted slowly even with 6^{o}C of heat. He advised that so far the sea levels had risen by four metres on average and that that there would continue to be a slow increase in the years ahead. These should not threaten their existence in the village during the next four decades though if it were not possible to reduce the average global temperatures significantly over that time, the sea levels could over the next few hundred years rise by another 55 metres, thus inundating the whole of Long Island and most of the world's large cities. However, he was fairly certain that this was not something that they would need to consider in their lifetimes.

He pointed out that currently the large amount of decaying vegetation would be producing many of the carbon containing gases. All these factors together with the constant high levels of water vapour in the atmosphere were still causing rises in average global temperatures above the 6^{o}C they were currently experiencing. He expected heat levels still to rise to around 8^{o}C above preindustrial levels over the next two decades. His understanding was that the sea concentrations of CO^{2} were at saturation levels, so that the oceans could not absorb any more from the atmosphere.

Also, he indicated that the research into more effective ways to reduce the concentration of these gases in the atmosphere were showing promising signs that they could achieve measurable deductions though it would be at least two to four decades before they could bring the carbon dioxide levels in the atmosphere back by any significant amount. In his opinion, it would be necessary for those humans who lived under domes to continue to do so for most of their lives. He realized we all were longing for the days when we could again live out in the open and enjoy the greens of nature. That would be unlikely in their lifetimes.

The second aspect to this topic, how has climate change impacted on them up till now, resulted in everyone wanting to add their bit. There were so many aspects to how it had impacted on every resident, though it was not all negative. The most common change it had forced on many residents was the need to leave the homes they had lived in for years, often inherited from their ancestors. This resulted in them

losing contact with most of their friends. The next most common impact was dealing with the extreme weather patterns. As well, large number of residents had been severely affected by the gang wars involving shootouts that resulted in so many deaths. However, for almost everyone it was in the 2050s when the heat killed so many people, mostly the elderly, disabled and the very young, that they were mostly badly affected by it all. This was greatly exacerbated by the many deadly viral infections which killed so many of their friends and relatives. Then came all the impacts on their families, travel, their working ability, the cessation of their beloved sporting entertainment, their access to education, etc.

Some turned to Donald and asked him what life was like before all these changes happened. He said it was mostly very predictable, though in many ways very boring. They spent most of their time working and coming home exhausted. He said they had access to all the modern benefits though were still stressed by the pace of living, the continual economic downturns, the level of political instability and by the concerns about gun safety. His house had been invaded twice by gangsters who pointed guns at his head while they ransacked his house. He pointed out that the divide between the rich and the poor was at its highest level in 2024, 40 years ago. The very wealthy 1% of the population of the USA owned most of the wealth of the country, while most Americans struggled to make a living. He realized he had become reasonably wealthy though it did not make him happy. He had become a sad and bitter man. Most Americans in the 2020s were not a happy lot. However, he said that, as he understood it, most of the very rich had lost all or most of their wealth and that we were now all on a level playing field striving to survive. His first impressions were that their village was making a good attempt to do so. However, he strongly supported the Mayor's desire to move beyond survival, and greatly improve the way they lived. They needed challenges to make them more proactive in the fight for long term survival.

He went on to say that he realizes that he missed all these terrible changes they had endured, though had to admit that his life in the dome had been the most relaxed and enjoyable time in his life. He said, 'let's not try to go back to the type of life we lived in 2024. You have all shown that you can do a lot better.' He noted most of the group nodding approval. He did not realize that the Mayor was listening in to the discussions of the various groups intermittently, and ended up listening to much of Donald's group discussion most frequently, realizing that this group was really dealing with the issues. She was extremely impressed by Donald, realizing that he was shaping up to be a leader in this whole project.

The groups came together and found most had a common theme. They had all suffered though saw that their current way of living was relatively enjoyable and

relaxed. Though some groups had also focused on the plight of those who did not live in domed villages. They challenged the Future Planning Group to consider all those remaining humans when they plan a course of action for the future. The Mayor agreed, though also pointed out that they may be fairly limited in what they could do with the resources available. They ended with a relaxed morning tea chat with each other.

Chapter 6. B. The second consultation event.

It was time to meet again during the following week. The Mayor reminded them that the task for the day was to determine what type of existence they wanted in the future, taking into account the necessity to ensure it resulted in the continuing existence of the human species. She also emphasised that their concepts needed to be realistic in terms of the current and possible future state of the climate and the resources available. However, they needed to be innovative. They should include changes that they believed could be achieved by altering what could be changed.

Donald remained in the same sub-group. This was a much more difficult topic to deal with. The Biology Professor reminded them that global heating will still increase though not so rapidly as it had done, and that it would most likely take many decades before any small improvement in climate stability could be expected. He also pointed out that there could be other seismic factors to consider. He noted that there had not been any significant earthquakes or multiple major volcanic events in the USA for the last 43 years and it was highly likely that some of these were overdue.

However, Donald pointed out that San Francisco had been expecting a major earthquake since 1908 when the last very significant quake wrecked that city. It had not yet occurred, and seismic scientists were now able to predict when some of these events were imminent. Perhaps it was best to plan without worrying too much about such events, though we needed to always have emergency actions planned for their occurrence. The Professor pointed out that with multiple volcanic actions occurring at the same times the sky becomes so clouded in ash that the sun’s rays cannot reach the surface of our planet for two to three years after. This greatly impacted lifestyles during such times. Donald reminded the sub-group that they needed to determine what they would like life to be within the circumstances they know they must definitely expect within the next few decades. Trying to take all possible contingences into account would make their task almost impossible.

A few of the older residents pointed out how much more relaxed they could live without the fear of gun violence. However, others pointed out that they were continually relying on guns to keep their village safe. A few retorted that what they are considering must include dealing with the need to have guns, and that they must

consider what life should be like for those who were still very disadvantaged and who needed guns to survive.

Donald reminded them that a critical requirement within this topic was to ensure the numbers of humans starts increasing rather than decreasing, and that they must have a safe place to survive in. It could take many decades to help every remaining human to live a peaceful existence without guns, though he also was greatly enjoying living in the village without the fear that guns cause. He strongly supported them building in a long term aspiration to live in peace without guns.

This directed the groups attention to the desperate need for a greater number of babies to be born in the village. How could this be increased. Donald pointed out that it was up to those residents of domed communities to lead in achieving this increase in children, having such a safe environment for them to grow into. An older woman pointed out that, using the *in vitro* incubation system, they could greatly increase numbers of children being born by collecting more ova from young female residents and artificially fertilising them with donated sperm. However, the difficulty was in finding residents who were willing to look after these babies initially and then as growing young children. She reminded them that it was essential for human infants to know and experience lots of love for them to develop into knowledgeable, responsible and respectful young adults.

Donald suddenly thought, couldn't I raise one? I always wanted children. I am old though have two robots who could be easily reprogrammed to help with such a task. He made this wish known, expecting a backlash as would have resulted in 2024. Instead, he found a number of older residents offering to do so. They all said that with so much leisure time, they have no excuse. Rationally they all realized how critical increasing the number of children was, and agreed the domed villages were the safest and most well organized locations to start this programme going. Another older male resident who had also volunteered to raise a child pointed out it would be best not to progress too quickly, to ensure it all was working well.

Donald proposed that all older residents who felt they could manage it should at least contribute to doubling the numbers of potential residents who would replace them when they died. The group agreed unanimously to support this recommendation when it emerged during the final session. It was also recommended that the Village commence a program to meet with and encourage young adult residents, both male and female, to adopt a baby. So many had already decided it was too risky to produce their own. However, if it were carried out as a special project ensuring survival of the human species, this should help convincing them of the urgent need to do so.

How long can we all keep living in these domed villages came the question? We

have such a great life here. The Professor replied that it was a very artificial lifestyle though agreed that for the foreseeable future the outside climate would be too harsh and dangerous to move into. Domed village life could be maintained as long as it was needed, and their task was to plan for what could be achieved in their protected village before 2086. Donald pointed out that this project is providing the opportunity to plan the future for themselves. What we also have to consider what would they like to see happen in the future for those who lived outside domes, in particular those who had moved out of small towns into farming regions? He said he would be willing to donate funds to help specific groups survive more easily, though was not sure firstly what they wanted and secondly how they were going to achieve any changes. It was proposed that, during the next session, they would recommend their village set up a small research group who would visit specific groups of these communities closest to their village to find out how their survival even in terms of population growth could be most effectively supported. Donald was asked if he would set up such a group and get it working. He agreed, thinking I want Eli to be in with me on this project.

When it came to discussing how they could recommence the sporting amusements the older residents had so much enjoyed, such as baseball, grid iron and golf on a real course, it was realized that this was totally unachievable within the foreseeable future. However, when it came to the possibility of setting up University level education, the possibility of liaising with a number of domed communities to join together for this purpose was discussed. Members of the group asked the Biology Professor what he thought. He was very agreeable with the concept, stating he felt it would be something they could achieve within their village. He would try to visit all the closest domed villages to see what was achievable. He knew there were former academics living in some and was sure they could start some courses. The financial aspects of such a venture were an unknown and he would try to determine what funding could be attained. Donald offered to start a fund with a US$500,000 donation to get such a University developing in their village. Wow, came the responses followed by prolonged clapping. Donald knew he possibly would only live another 20 years and he had no offspring as yet to leave his estate to, so might as well do something useful with it. And he realized a University would go a long way to help them achieve their objectives.

One of the middle aged women in his group named Joy asked if music and drama could be included within the University subjects? She remembered as a young child how great an influence her family's involvement in these activities contributed to their enjoyment both as a family and in socializing with friends. Many of the older members joined in pointing out that this could be one way to increase the social

cohesion within the village. However, it needed a few residents with some level of expertise in music and drama to be able to start such activities. Another member named Jean said she had learned the violin though was not at the level where she could teach it. Perhaps they could advertise for such people with this expertise to be invited to join the village. Both Joy and Jean were asked could the make enquiries in the village just in case there was some hidden talent amongst the residents. They all realized that both music and drama had been activities that suddenly disappeared in dealing with the climate crises. They all listened to the old songs on their arm phones, though hardly anyone played a musical instrument or brought one with them in the haste to move to the village.

The final area of concern was the work opportunities available for an expected increasing population within the village, as well as the expanded accommodation space to cope with it. It was generally agreed that there was so much still to be done to increase the survival of the human species, that it would help to set up an 'innovation of the workforce' group, whose task would be to research the potential new opportunities for paid work within their village. It was evident that an increased number of children would create many jobs, initially such as child carers, then as teachers. How could they obtain teachers? Through the proposed University. It was all starting to come together and become exciting.

Ideas such as setting up heat resistant algal farms outside the village was one. Another was to encourage the setting up of a business to purchase musical instruments, or even invite a person who could make stringed instruments to join the village. There was strong support for all these measures. When the groups came together, the Mayor was amazed at the range of ways the groups presented to develop a greater level of social cohesion within the village, as well as the types of employment that could be generated. She was particularly impressed at the plan to increase the number of babies born in the village and indicated she also would be very willing to adopt one also. She was also very impressed at the obvious contribution Donald had made and his offer to donate half a million dollars to a startup fund to commence a University training program within the Village.

She was aware that a number of recommendations involved inviting new residents to join the village though was not sure how this could be achieved. Donald asked if it were possible to add an extra six or eight domes to the village to house these new residents and to provide the space for the University to be set up. He wondered if the domes housing the University could be built as an adjunct to the village where these outside people could attend educational classes though not officially enter the village? 'That's a great idea', retorted the Mayor. However, she replied that the Village Council did not have the funds to do that, and they would not

be happy to impose extra taxes on residents at present. Donald replied that he would research the costs of doing so, and would search for a funding source, knowing that he would need to consult Eli to determine whether he had enough in the bank to contribute something towards such costs.

The Mayor closed the session, adding that she was extremely impressed at the range of ideas that were planned, particularly by Donald's group. She then reminded the consultative group that the next stage was working out how these concepts would be implemented. Afternoon tea followed with a sense of excitement that they all could see a way forward not only to ensure their long term survival but also to thrive and increase their enjoyment surviving.

It was only when he received a copy of the minutes of the meeting that Donald realized how much he had committed to. But in a way he felt elated to be offering to contribute so much. He was at last totally enjoying living, and it engendered in him a deep desire to achieve something that benefited the village community that had enabled this to happen. He realized also that he was becoming increasingly infatuated with the Mayor. What a woman! She provided just the right leadership so desperately needed at that time.

He underlined all the commitments he had made in the minute sheet and started to write down all the ways he might be able to recommend that they be put into action.

1. Stating he would be prepared to adopt a baby. He noted that he needed to consult the staff who imported and programmed the robots and ask whether they can be reprogrammed to be nannies to these babies in terms of carrying out all the routine tasks involved, while retaining their current requirements. He knew he would need to spend a large amount of time with the growing child, though had this deep down desire to do so. He must not make his earlier mistake of becoming too busy to look after his personal family interests.
2. His second commitment, as well as his third and fourth must involve Eli. He felt he could not progress until he discussed with Eli what he could afford to donate to the various causes and would Eli join with him in tackling some of the other issues he had volunteered to undertake. In particular, would Eli join him and a few selected Residents to carry out research into ways the village residents could help those living in communities closest to the Village to survive? He realized it would involve trips outside the Village. They would need to employ a team of bodyguards to help them stay safe.
3. Another commitment was his offer to contribute US$500,000 towards getting a University set up in the Village. He would immediately phone Eli to check if this was OK.

4. He had to advise Eli that he had offered to determine the costs of purchasing an extra 6 to 8 dome units and have them attached to the village. He had also offered to seek funding to do this. Would Eli be willing to work closely with him to achieve this?

   When he described all these commitments to Eli, the reply was, 'Donald, you did jump in at the deep end'. Eli said he could manage those donations but to be cautious not to overspend. Eli said he would also be willing to contribute financially to some of these causes. Then he asked Donald did he realize the enormity of many of the projects, e.g., the space required for the University, the cost for expert staff, the overall ongoing maintenance costs. All these have to be considered before it is feasible to come up with a realistic proposition.

   Donald replied that we could start by asking the Council Infrastructure staff what their estimates of the costs of purchasing extra domes might be. We would need to research through the internet (which was still running in a reduced format) to ensure we had the best prices and delivery requirements. And he had in mind to approach the New York Bank of the Future to see how they could help. Eli replied that it was not the best time to be asking for a loan from a bank. Donald retorted that it was not a loan he would be after but a sizable donation. 'Good luck' was the reply. However, he admitted it was a very good idea and he was happy to work with Donald to firstly get an estimate of the costs, and to do some fund raising.

   Donald went on to advise Eli that he had also planned to submit a grant request to the head of the Emergency Survival team in down town New York, pointing out that the time had come for those humans who are able to move forward to begin to do so. He acknowledged that he could only do so after asking the Mayor if she would send a list of the Village's proposed future action plan when it was finally decided. 'You had better get all this done before you become a father to a baby' was Eli's somewhat challenging remark. 'Yes' was the reply. 'We start tomorrow.' He asked Eli if he would go to the council Infrastructure office with him at 2PM the next day if he could arrange an appointment. He agreed.

   The next day went well. The robots could have extra tasks added, though the programmer stated that looking after a baby would require a certain degree of emotional response mechanisms to be included, which is quite costly. 'Not a problem' was the reply. The Biology Professor said it was quite an undertaking to list and estimate costs of commencing a University though give him a week and he would come up with something. The visit to the Infrastructure Department was a bit more difficult. The senior Council buildings

officer was somewhat surprised at such a request and asked did the Mayor know about it? Donald replied that it was a hypothetical question but pointed out that the Mayor was asking a consultative committee to come up with ideas to plan for the future of the village and that he needed this information to present to their next meeting. He explained that he could not divulge the reason for his request as the Mayor had asked for it to be kept confidential until a final plan had been devised and approved by Council. 'Well', said the Council officer, 'looking up the current estimates of costs to purchase the types of dome units that comprised their Village, each one would cost US$680,000, installed.' 'No second hand ones cheaper', Donald asked. 'Definitely not. They are in great demand world wide.' 'What is the waiting time for delivery?'. 'Two years at present'. 'What is the installation time?' 'Five months'. 'Thanks'.

'It looks like we need to confine new dome supplies to 4 or 6 and that will be around US$4 million' Donald said pensively to Eli. 'It's going to be very difficult to raise that amount. Would you come to the bank with me tomorrow, Eli?' 'Sure.' The New York Bank of the Future manager looked quizzically when Donald put the hypothetical question to her about a possible donation over the next two years towards purchasing some extra domes to enable a University to be set up in the Village to supply the surrounding area. 'Í would have to see a formal plan for such a project and know it has the Council's approval before I could even make any comment,' she replied. 'If you had that plan, what is the probability of your making a donation,' Donald asked. 'We have not been asked such a question for many years' the manager said. 'It would have to go to our Board of Directors in old New York town', she replied. 'I have no idea how they would react, given the difficult times we are in'. 'What about the probability of a loan of say around 2 million?' We would require sufficient collateral guarantees.' 'Would you consider buying some domes and renting them out?'. 'Again, under the same conditions as for a donation, we would need a Board decision.' Is it possible?' 'Probably possible'. Donald thanked the Manager for seeing them and they both left to consider the replies. 'Let's sleep on it' said Donald.

The matter of a survey of the needs of the people living outside the Village was put on the backburner for a while. Donald spent a few sleepless nights puzzling over a possible plan of action in relation to the domes and the University. Most likely they would have to do with fewer domes, at least initially. He was planning to donate a million if Eli approved. Eli had indicated he personally could donate $500,000, and possibly more. However, it seemed that it was all hypothetical until the final council decision was made. He started

working on the approach he would make to the consultation group when they next meet.

Chapter 6. C. The third consultation event.

The Mayor welcomed them all to the final discussion over planning for the future. She pointed out that the ideas they had come up with last session were very good though many were costly. She advised that they needed to pare their aspirations down to the funding that may be available. Also, there would be a further final meeting once the plans were all in a final draft form which would be considered for approval at a formal Council meeting.

Donald opened the meeting of his group saying that they had already considered in a general way how they might implement some of the proposals they had previously come up with. However, already he had found that some of these suggested proposals were beyond the funding sources available, though could be paired back to what was achievable. In other areas it might take many weeks of research to determine how they could be actioned, both in terms of organizational management and cost.

He went on to propose that the one thing they all considered essential was to increase the numbers of babies born within the Village. He reminded them of the statistics he had presented at the last meeting. Donald continued, ‘As you can see, we need a very large increase in the numbers of children to replace the 15,000 of us over 50 years of age. Most of us will not be here 20 to 30 years hence. I propose we aim to produce a further 30,000 babies over the next two decades, or 1,500 each year. This will require a large number of the residents to consider being prepared to raise these babies through to when they are into their 20s. I am aware many of the over 50s I have talked to have indicated that they would be prepared to raise such children with the help of their robots, though we will need to appeal to the young adults to be prepared to also contribute.

I know that I am a bit old fashioned and would like to see more of that age group agreeing to live together and have at least 4 children in each family. The females don’t need to bear the children. They can be grown in the uterus nurseries as all those coming to the older residents will need to be. If we can paint a picture showing the desperate need for more children and can guarantee that the Council Health Department will provide many services to support them, this might help convince many to become involved. Perhaps we need an old fashioned dating service!’ An amused giggle followed. Even so most of the group agreed with his proposition, though expressed the need to

proceed with caution. They agreed to make this their first recommendation.

The second topic for discussion Donald put forward was the development of a University within the village. It would have to be confined to providing those faculties which provided immediate practical benefits to the village in terms of assisting their efforts to provide both jobs and to increase the social cohesion and their quality of life within the village. He asked the Harvard Professor what he had been able to find out about potential lecturers. Professor Hardinger replied that he had located 10 former academic lecturers in music and drama, engineering, education, economics, nursing and medicine and law who would be willing to move to the village if they could be guaranteed accommodation and a reasonable salary. He pointed out that Eli was regarded as the senior law practitioner currently in the village, though he had indicated he did not wish to be involved in teaching law.

Professor Hardinger had worked out that it would result in the need for extra AUs for 10 to 12 individuals or couples and an area of at least two extra domes to house the buildings for the University faculties, including an administration block. He advised the group that the University would provide work opportunities for a number of the Village residents. He added that if they wanted to include attendance for students outside the village, this would require an extra lot of accommodation for these students to live in as dormitories and these would need to be separated from the village. He had estimated that altogether it would need at least 4 new domes to be purchased to achieve the first stages of establishment of a University.

Donald thanked him profusely for the work he had carried out in the past week. He went on to let the group know what he had found out that 4 domes would cost US$ 2,720,000 to purchase and install. He had talked with a bank manager who would require a very thorough plan endorsed by Council before they would even consider contributing either a donation or a loan. He added that he had asked if the bank might be willing to purchase one of the domes such as the one to house outside students and they said such a proposal would be considered.

Then he remembered to ask the two women who had said they would canvas the village for residents who could play and teach music. Sadly, that had found no one capable of teaching it, though many who had been proficient musicians, who would be willing to help form musical groups and they would attempt to find their old instruments. This was most welcome. A member asked Donald if the costs of running the University such as staff salaries, stationary, maintenance, setting up a library and maintaining it, and

other general running costs, had been taken into account? He replied that student fees would have to be charged to cover these running costs, though he would expect that such fees would be subsidised by grants, or as a loan to be repaid on graduating. He would be willing to make US$500,000 available to the University to provide student loans on the basis that they would be repaid within 3-4 years of graduation.

Donald continued, 'the critical initial requirement is to prepare a very thorough development management plan'. He believed it was practically achievable to find the finances that would be needed to make it happen. He would contribute a million dollars towards the cost of domes, and he knew of another donation of half a million dollars. If this concept was approved by the Council, he would be willing to sit down with the Professor and his attorney, Eli, and council staff nominated by the Mayor to draw up such a proposal to be considered initially by Council. There was great applause. It seemed it would be achievable.

The next topic was the provision of jobs for the increasing numbers of children as they became adults. It was considered that the University would create many jobs, though there would be a constant increase in need for jobs over the next 20 year period. One of the earlier suggestions was to progressively build a virtual moat of heat resistant algal ponds around the whole village. It would supply a great amount of nutritive vegetable material to enable a food processing plant to be set up in the village.

The Biology Professor was particularly keen to be involved in such an enterprise and asked why keep it to algae. He pointed out that it was now evident that there were being discovered an increasing number of plants that could withstand even the 8^{o}C increase in temperature they were currently anticipating. It would be a great long term project to totally surround the village with such plants. He pointed out that if a Department of Biology can be set up in the new University, he was keen to experiment with transferring genes from Archae microbes which helped them survive in extremely hot geothermal vents into a number of algal species to see if increasing numbers of new heat resistant species could be developed. If these could be placed back in the shallower areas of the oceans and in the rivers and lakes, it may help consume much of the carbon dioxide dissolved in these. All the group endorsed this concept.

Some members pointed out that both the moat of ponds project and the University would be ways in which they could help those living outside but close to the village to gain employment which would improve their chances of

survival, as the Mayor had kept reminding them was another factor to consider. Donald had indicated that he had not yet had the time to visit these people to ask them what their greatest needs were. He would do so very soon. Again, the Mayor had been listening and could hardly believe the energy and ideas and donations Donald brought to his group. He had done his homework and suddenly he had made all she had hoped for during the last decade possible. She would ask him to work closely with her in drawing up the proposal to Council. The groups came together to submit their proposals. Some of the groups felt they must try to get competitive sports like baseball and basketball back between villages though could not come up with a way to achieve this considering that they would need to be played in stadiums outside domes. The heat levels are likely to continue increasing and the weather was so unpredictable and dangerous to be caught in. And what humans could perform in that heat without succumbing to heat stroke.

The whole of the consultative committee were particularly in favour of the scheme to increase the population of the village over the next two decades. Some wondered how they could fit such increased numbers in the current area, though it was pointed out that the children would only need separate rooms to live in once they reached around 10-11 years, and those numbers would not be great until at least 13 years hence. Hopefully it would be possible to expand the village area by then.

The Mayor thanked all the members of the consultative committee for providing such a great range of ideas to achieve the original aims of the committee. She advised that she would over the next month ensure their recommendations were brought together into a manifesto which would be presented to the reconvened Future Planning committee for their endorsement. She would then present the endorsed plan to the full Council for their approval. This statement would then become formal Council policy which she would seek to have enacted as soon as possible. She invited them all to a grand afternoon high tea to thank them for their contributions.

Chapter 7. Preparing the mainifesto.

During the high tea, the Mayor asked Donald could he stay a bit longer. When everyone else left, she invited him into her office and thanked him profusely for providing such leadership in the process and for his offer to contribute so much financial support to seeing the University established. 'By the way,' she said, 'my name is Heather. Heather Lantersohn. Please call me Heather. Would you be willing to work with me to pull all this together into a manifesto, to present to the council?' He agreed. 'I am keen to get this moving quickly', she continued. 'Could we meet here every second day? I will write an introduction. Can you do the University, work opportunities and assistance to outsiders part? I am aware that is the most difficult task though you have done so much research in the area and I know you will provide a very convincing case for support for the University and the jobs innovation program. It will take some time though perhaps we can review progress when we meet.' He pointed out that he still had more research to do, though could manage the task she requested.

'Do you have time for a coffee?' she asked. 'We seem to see the current problems with the same degree of concern. I hope we can get to know each other much more closely. And we have both agreed to foster a baby in about a years time. I am a little worried about how I will manage. How do you feel about it?' He agreed to chat and they discussed so many issues. Donald indicated that he was actually looking forward to minding a baby, though realized that it would be a very time consuming, though very enjoyable task. Having the robots would greatly help them cope. Heather seemed somewhat relieved on hearing this.

She pointed out that she had been married though her husband had joined the militias that were trying to restore law and order though had been killed in a shootout with the gangs. They had postponed having children until it could be made a safer place for them to survive. He expressed his sadness to hear this. She became a little tearful, and he offered her his handkerchief. He could not believe this was happening. He saw her as a remarkable business woman yet she was so human. He could still sense her independence though she was willing to open herself up to him. They parted with a hand shake and he returned home feeling very strange. He had not expected this closeness to develop with her. Their meetings focused on developing the manifesto, though always ended with a coffee and a chat about so many issues. The more he got to know her, the more he felt closer to her. It took four weeks of meetings

before the manifesto was completed. It was a long document though had to convince the Council that all the proposed projects described could be achieved. It also had to convince the bank or other funding agencies that it was something they could support with confidence as to its outcomes.

The whole document started with the intro from the Mayor pointing out that she was sure all the village residents felt they had gradually settled into a stable living pattern in the domed village. They had demonstrated that they could survive the cataclysmic climate changes and their effects within the domed village. However, was that enough to ensure they could survive into the future? She continued to provide the numbers to support the case for the need for a great increase in baby numbers. They had all focused on survival, though now that they had survived in the short term it was essential that we all start planning for long term survival of the human species. She urged the council to consider adopting the manifesto as the policy to help not only survive into the next century but also begin to regain some of the most beneficial aspects of the past to help them prosper into the future.

Donald's focus was to describe the great benefit developing a University within the village would be and outlined the plan to achieve this. He included the plan to make contact with some of the surrounding communities and invite students from them to study at the University. The costs and plans to meet these without there being an impost on the Village finances was included. The next focus by Donald was on the creation of new jobs within the village designed to increase their quality of life but also to plan to build a sustainable future for all residents in terms of ensuring all those that were in need could earn a reasonable income.

The Mayor and Donald felt the final document had covered as many aspects of the proposals as could be achieved. It was planned to present it to a special meeting of the Consultative group the following week. The members enthusiastically endorsed the manifesto statement, recommending only a few minor amendments. The Mayor planned to present it to a full Council meeting in two weeks time. Copies were sent to all the elected Councillors, so they had plenty of time to read the proposals. The meeting was fairly heated with the usual pessimists seeing it as too optimistic. Most however agreed with the need to increase the population over the next two decades. It was the University proposal that received the greatest attention, with concerns about its costs. The Mayor very wisely proposed they support the whole document of proposals subject to further evidence that the University infrastructure could be fully financed by grants and donations, ensuring it would not become a

liability on the Council. This worked, and 68% of Councillors voted in favour to proceed with these conditions attached.

After the meeting Heather and Donald went to her office to celebrate. She opened a rare bottle of champagne she had kept for such an important occasion. Very little alcohol was available at this time. With glasses filled she insisted they bond arms to drink it. She drew near and kissed him on the lips. After a few glasses she put on some dance music and they danced for the next hour. Again, Donald could hardly contain himself. There followed a cup of coffee and a chat. She said, 'Donald, I wondered if I could ask you a favour. You know how nervous I am about fostering a baby. I wondered if you would be happy for me to arrange a swap of AUs to the one next to yours. I know I am a bit old fashioned, though I feel it would be good for any child to have a mother and father figure. That way we could share the raring of the two children, while living independently'. This left Donald a little perplexed. Even so he was aware that he was still not sure he wanted to progress to a closer relationship, living together. He had lived independently for so long and enjoyed it. Perhaps this was a way their very close friendship would best survive. He agreed. Again, she hugged him and was so thankful.

Chapter 8. Putting the future plan into action.

After the exhilaration of the Council meeting, Donald realized that he needed to start work on the University project very quickly. He arranged a meeting with the New York Bank of the Future manager, presenting a grant request which the Mayor and he had countersigned, to ask for funding support from the bank to build the infrastructure needed for the University. The request included a copy of the document the Council had passed. The meeting with the bank manager went well. Donald stressed that the bank would greatly benefit from the increase in commerce that the University would generate. He also assured her that the bank's contribution, whether it be a donation or a loan, or it's purchasing a dome and renting it out, would be widely made known around the village in the residents' arm phones and the bank would have naming rights. The manager said she will submit his request to the Central Bank management in what was left of New York city centre, with her strong support for some assistance.

Donald also wrote a similar submission to the Department for Emergency Survival in the old downtown New York, asking for financial support. Again, the submission pointed out how important it was to not only survive but also advance. The Mayor signed it with Donald's signature following, and it was immediately sent. In the meantime, he worked with Council staff to determine where the four new domes would be located. The location of the one to accommodate the new academic staff would be attached directly onto the current domes. The remaining three were to be separate from the main village dome structure though with a narrow passage way between them where village staff and students could activate a door to enter the University buildings. He was aware that actual physical work could not commence until all the funding he outlined was needed was definitely guaranteed.

Donald's meetings with Eli had been postponed during the frantic 6 weeks of drawing up the future action plan. He saw him briefly on a few occasions to keep him informed of where they were at, and to ask his opinion or gain more information on a number of issues. Now that that phase was over, he asked could they continue to meet each week for a long discussion. He had stressed a number of times that he greatly valued Eli's input into this whole project, though felt too embarrassed to let him know of the close relationship he had formed with the Mayor. Eli sensed something was going on. They soon settled back into the close friendship they had previously enjoyed.

He asked Eli about the proposed visit to some of the neighbouring settlements outside the dome. Eli was much more familiar with the dangers involved and pointed out that they would need an armed escort to get safely to some of the communities

in their electric vehicles. They would be safe within the perimeter that the Village militia patrolled, though some of the outside communities also had to have their own militias patrol around their settlements. Eli advised he could organize that for the following week. He would send messages requesting a visit to ask what the domed village residents could do to help them survive into the future, so that their visits would be expected.

Meanwhile, the Mayor had become extremely busy visiting the uterus nursery to advise them of the council project to greatly increase the number of babies born. They were somewhat shocked at the numbers they were expected to produce. The Mayor advised them that the council would fund the expansion of their facilities with view to their being able to produce up to 15,000 over the next 10 years, with a further 15, 000 in the following 10 years. This would mean around 1,500 per year. Currently they were only growing 150 babies per year. However, she advised that they would increase the numbers incrementally, starting with an extra 400 in the first 9 months.

The Mayor advised that the health department would be conducting information sessions for all young adults to convince them of the need to greatly increase the population, encouraging them to at least work together to adopt some of these babies, or even agree to have the females bare some children naturally. The council would provide strong support in terms of AU modifications and with child care services. She also pointed out that the ova and sperm collections were intentionally taken from 245 donors, to ensure there would be no risk of inbreeding. Very good records of donors would be kept so that all children could find out who their biological parents were if they so wished in the future years. The Mayor also advised that she was preparing a survey of all those residents over 50 to ask how many would be willing to adopt babies and rear them, again with strong council support. She pointed out that she would be one of these older residents to adopt a baby. The time for Donald and Eli's visit to the outer communities came. Three armed vehicles surrounded their vehicle and carried extra batteries as they were not sure whether any plug-in points would be available in the communities. This was a new experience for Donald. He was astounded by the amount of dead and dying vegetation, the terrible state of the roads, and the abandoned homes. He was also aware of the increased heat outside the dome, though had cool air in the vehicle. Eli had chosen a time when the forecast was for relatively stable weather to accompany them. They passed many checkpoints maintained by the Village militia.

The first community that visited was just at the edge of the area their militia protected. He was surprised to see that the residents were well dressed,

and well organized. 155 people lived in this community and had bonded together to ensure their modest houses were as protected against the weather as could be achieved. They relied on the central emergency department in what was left of the downtown area of New York supplying processed food and hydrogen gas supplies. They had solar and wind power generators and kept cylinders of hydrogen gas for cooking. They also had lots of guns ready to defend the community from the occasional gangs that still roamed through the area. All the women and children knew how to use these weapons and they had prepared hidden bunkers as an emergency hideout. When asked if the domed village could assist them in any way, the residents through their elders stressed the need for visits by health workers to help them cope with childbirth, vaccination against disease and nutrition problems. They said one teacher tried to keep an education program going though some help with this would be very welcome. When Donald told them about the program to develop a University in the domed village and that there was a fund to subsidise the cost of their students living in and studying there, they were extremely thankful. Donald and Eli could see that pure survival was their number one focus and that bringing up population development was not appropriate. They thanked the community representatives for welcoming them and promised that they would receive as much of the help they had requested that the domed village could muster. Donald was almost overcome to see how they struggled to survive. Eli even more so. Both knew that they would do their utmost to help these fellow humans.

When their convoy reached a very desolate area and no habitation was visible, Donald asked could they stop so he could get out of the electric vehicle and experience the heat. They did so, and he quickly became aware of what an extra 6^{o}C+ of heat felt like. He realized yet again how privileged the domed residents were. Soon they came to another slightly larger community outside the main village security circuit. These had worked hard to provide their own security. There were multiple fences surrounding it, made of a lot of old solid iron slabs that had come from an old foundry nearby. These people were really struggling, though their requests were very similar to those from the previous community. Their clothing was ragged and the morale within the village was very low. The death rate within the village was very high partly from malnutrition, disease and sanitation deficiencies. This village needs a lot of help, they both realized. The residents spent any income they had on security, being frequently attacked by gangs. ‘I wonder if our militia could extend their area to include this community,’ said Donald. Eli did not think so. The final community they visited was in a similar state.

Both Donald and Eli were

starting to think they had bitten off more than they could chew. They headed back to their village, realizing just how fortunate they were. However, they both were also starting to believe they had a responsibility to do something to help these last two communities. But what and where could they start. On returning to the village, they stopped to chat for a while. Donald said, 'I wonder if you and I could take three different health experts and two teachers with us once a month to visit these three communities. They could take medicines and other health support items and the teachers some extra teaching aids. I think that some extra clothing would be a great help to the last two in particular.' Eli agreed. 'I will ask Heather, I mean the Mayor, if this could be possible.' Eli had a smile that could swallow a banana sideways. 'Heather', he said quizzically. Donald's complexion turned a bright red.

A month after the Mayor and Donald had summitted the grant request to the office for Emergency Survival in New York City for funding to start up the University, they received a request for them both to come to a meeting at their downtown New York headquarters. They were told to bring an armed escort, though that the roads to their building were still navigable and above the new sea levels. Eli had heard that most of the southern end of New York city was now under sea water, as was most of the north-eastern section of Long Island. The western sides of Long Island and their central location were well above the new sea levels. They had been advised that the seas were not expected to rise more than 30 centimetres over the next two decades.

The day came for the big adventure into New York city and Donald was really looking forward to seeing some of his old haunts. Their electric vehicle with three armed support vehicles made the 30 mile journey with no major problems. Their vehicle had air conditioning, so the trip was quite comfortable. The roads had deteriorated greatly, having had no maintenance for a few decades. However, they could see from some of the higher stretches on the roadway that the sea had covered many of the eastern coastal villages on the Island. They came to the Emergency Survival office which was an old four story building. Donald remembered that he had sold this building to the Government 50 years ago at a considerable profit. Their electric vehicle entered through double doors to help maintain the internal efficiency of the air conditioning. They were met by a human who gave them a great welcome.

Following some light refreshments, they were ushered into a room with many staff present. The Head of the Office came to personally welcome them, and they were seated near him at the table. The Head opened the discussion by telling them that the Survival staff were extremely impressed by the request they had received from the Jane's Hill Village. They were advised that they were the first domed village

in the new Lower North East State to start to plan for their long term survival. They were quizzed for the next few hours on exactly how they planned to achieve what they described in their submission. After breaking for lunch they were advised that they would be informed of the result of their request later that afternoon. An offer was given to spend the night in the rooms reserved for guests on the top floor, which they accepted. Donald asked if it was safe for them to take a drive around some of the old city. They were advised to take an armed support vehicle with them though that generally it was safe. Heather had not lived in the old city though was intrigued to see so much of the southern area inundated by sea water.

Donald could hardly believe what he saw. His old office was now a wreck, with around two metres of water in and surrounding it. It was the same with Eli's old offices. So much of the old city was under water. It was almost too much to take in and they returned to hear the result of their grant request. They were told that the Emergency Survival office wanted their village to be the model for the remaining domed villages in the State. They were granting them three million dollars on the condition that they use the extra to help the surrounding communities also survive with them. One requirement was that they were willing to allow journalists and photographers to enter their village and its surrounds to record examples of what they in Jane's Hill Village were achieving. Heather as Mayor gave them assurance that was not a problem. She also assured them that their aim was to help as many communities as possible near their village survive with a reasonable quality of living. The extra funds would be used to achieve that integration. They retired to their top floor adjacent rooms somewhat exhausted though elated.

This was so much more than they had expected. Before entering her room, she gave Donald a great hug, and said she could not thank him enough for what he had helped the village achieve. He replied that it was her that had the ideas to start it all rolling. She kissed him on the lips, then entered her room. They were due to have dinner with the Head of the Emergency Survival Unit at 5PM so only had time for a light rest before. He kept quizzing them over the meal as to what they felt they could achieve, pointing out that their domed Village would most likely end up being the centre for planning for the future in their state. He asked if they would include a Central Office for Planning for the Future in the University. Heather replied that they would certainly do that. He asked if some of his staff could frequent the centre occasionally to both assist in their planning and be inspired by what they were achieving. After a number of glasses of champagne, they both retired to their rooms. What a day it had been!

Donald disrobed as usual as he liked to sleep in his birthday suit. However, his

mind just raced with the excitement of what they could do with three million dollars. After around an hour he was still awake. There was a little dingle on his arm phone. It was Heather. She said, ‘I just cannot get to sleep. Besides I feel a little uneasy without having my robot watching over me. Do you mind if I come into your room’. He said she was very welcome, as he also could not sleep. He slipped on his underpants, allowed her in and locked the door. She was wearing a very slim and partly see through nighty and he was amazed at the beautiful slender figure she had maintained at 60+ years of age. He was even more amazed at the beautiful boobs which he could partly see. She slipped into his bed. He surreptitiously slid off his undies and also climbed in. Heather same up close to him and put her arm around him. She planted one great prolonged kiss on his lips, and he responded equally. Their caressing became more fervent, and he realized he had an erection. One of her breasts had slipped out of her nighty and ended up in front of his face. He placed his mouth over it and began a vigorous though gentle caressing of her nipple with his tongue. Before long she carefully slipped herself around so she could find his phallus and slipped it inside her, and they began enjoying vigorous sex. She was letting out quiet little squeals of ecstatic joy as she had orgasm after orgasm. Finally, his sex organ exploded with an almighty orgasm and they both enjoyed one prolonged ecstatic moment together. They just lay there, both revelling in such bliss. After some time, she went to the bathroom and came back to bed. ‘Now I think I can sleep’, she said and snuggled up close to him and went to sleep. He also relaxed and his mind just floated with joyful thoughts until he finally dozed off.

When he woke, Heather was already up, had showered and dressed in her formal wear and was reviewing the statement from the Head of the Emergency Survival Department. He quickly showered and dressed, and they went down to breakfast. Their car was due to pick them up at 9AM and take them back to their village with their escort. Heather said not a word about the night but was back to her planning self and discussing with Donald as they left the old town behind what they could now accomplish. She said, ‘do you want to withdraw some of your promised donations?’ He said ‘definitely not. We can now do so much more. I would like some time to rethink the whole program in term of how we can now do more to help the nearby communities.’ ‘Yes, I would like to think about it a little more also.’ She burst out laughing, saying ‘I can hardly believe this has happened, and by the way, last night was one of the most beautiful experiences I have ever had’. He responded that it was for him to. They kissed again hoping the driver was busy watching the road.

Donald awoke in his own bed the next morning realizing that now it was all systems go. They had not heard from the bank yet though any support from it would

now be icing on the cake. He sat pensively at his desk pencilling in different ideas and worked out that now they could fund 6 new domes and as well might have one extra paid for by the bank. He realized that to achieve everything they wanted, it would be wise to plan for one extra, if further funds became available.

Donald was aware that they had to be careful to carry the great majority of residents with them in whatever they planned, and not try to bulldoze any major changes through the Council. He phoned Heather to ask could they spend an hour working out how to go about informing the Council and residents about the large grant, the purpose of it, and the conditions which apply. She said she had a number of issues to deal with immediately though expected to be free about 3 PM. Would he come to her office?

Donald informed Heather that from his visits to the communities, he felt that the most important factor was requiring them to have a very safe and comfortable place to live and this would be most certain if they could move into domes, and the domes were not located far from their village. He felt they must remain independent of the main village, though have relatively easy access to some of it, such as the educational facilities, and some of the health facilities. He pointed out that he had learned from his visits that most of these community residents lived in large traditional family groups, so that any accommodation for them would need to be different, and more high density. Perhaps it could be organized that their Jane's Hill village would be the central feature with other domes surrounding it. Smaller domes could be placed between them which house the primary and secondary education programs and health facilities. He asked Heather whether she felt their residents may feel threatened by such a system.

She replied that some would, though perhaps it might be a good thing if over the years there was a gradual intermingling between the central village residents and the community residents. This might encourage many of the central village residents to inter marry and revert to the old ways of living with large families. Donald was a little surprised at her statement though he had learned to never be surprised by anything she said or any of her actions.

They both agreed that there need to be a few information notices sent to the residents first pointing out that while their life in the village was currently very safe and well organized, this cannot continue if there is a gradual decline in the numbers of young people and if they become too insular. There was a need to point out that there is an urgent need to increase the number of children born in the village, though the numbers of humans needed to ensure survival in the long term on Long Island must ultimately result in those living in the communities outside the domed villages

also being helped to survive. Perhaps then it could be pointed out that the central state Department for Emergency Survival had asked if their village could be the one that sets the model for how this can happen.

Also, the establishment of a University would make them the only village on Long Island to have such an institution, and would currently be the only active one in the new state. This would then require them to spell out how it is currently thought this can best be achieved, using the plan he had put forward. It should be strongly pointed out that the Communities which would be housed in domes surrounding the village would not be permitted to enter Jane's Hill village. She agreed that they should not advise the villagers of the large grant until these series of information notices had been disseminated around the village. 'I will commence compiling the first notice tomorrow', she said. 'Would you be happy to look at it before I send it out.' 'Certainly,' he replied.

Donald was eager to let Eli know of the grant though also the requirement to keep it confidential. Eli was absolutely elated to hear the news, realizing how this could help those in the small communities struggling to survive, to now do so and contribute to the whole process of human survival. Donald told him of the Mayor's plans and asked him if he would be willing to be nominated as a manager of the resettlement program for these community people. He agreed. Donald briefed him on the whole process.

Eli was keen to find out how the trip with the Mayor went, though did not want to pry into his private life. He would wait until Donald let him know how it was all progressing. As for Donald, he also was trying to work out exactly what was happening. It was clear that Heather could put her business hat on instantly, and be quite formal with him, though when they relaxed she became a different person. There is so much to achieve at present, he felt it was essential that he did not expect more intimacy from her, though just enjoy the times when the intimacy occurred.

Donald became increasingly concerned at the level of forward planning needed. He spent much time at his AU making lists of the things that had to be done. The extra three million would help them cover the order of domed modules to establish the University so they now could start organizing that project immediately. However, it would be necessary to start the complex planning of how the outside communities could be resettled near them, without letting the grant request information get out. The only problem was whether the Council would agree to letting the University planning start without knowing whether the funding to achieve it had been ascertained. Perhaps it might be necessary to let Council members know about the grant, though tell them it must remain strictly confidential. He would ask

Heather's opinion.

Heather also was aware of the enormous amount of planning that was necessary. She arranged for meetings with Donald every second day so they could ensure it was all going to plan. Unexpectedly, within a month the three million dollars was transferred to the Council budget, so it would now be necessary to confide with Council members what it was for and let them know of the plans to hold the information back from residents until more information was provided about the future plans. Furthermore, unexpectedly, the New York Bank of the Future manager advised them that it would donate US$500,000 to the University project and would be willing to purchase another large dome and lease it to the council on a pay-back buy basis. Wow! Now funding was not a problem. They now could purchase 7 new domes and could guarantee the Council that it would all be paid for by grants and donations.

The meeting with Council members went well. The few pessimists felt they were 'biting of more than they could chew', though the majority were strongly in favour of the projects outlined by the Mayor. They realized it would greatly help their population problem and breathe new life into their village. The Mayor proposed that the council form a Future Planning Management Group, including both select council members and other residents which management skills and knowledge about the various aspects of the changes that would be necessary. This was approved. It was also approved for the Council to order in 6 large domes, knowing that it would take two years for them to arrive. This would allow them to work out exactly where each should be located. They also asked the New York Bank to order in a 7th dome.

The Future Planning Management Group (FPMG) included Donald, Eli, Prof Hardinger, and two Council members who had a business background and were very enthusiastic supporters of the project. Each was asked to undertake a list of tasks. For the Professor, it was to organize for the academics he had contacted to be ready to move into their new dome AUs in 2068, two years time. In the meantime, he was asked to draw up the list of Departments and include some advanced trade courses within the Engineering Department that would be critical to their future development. One of the major requirements would be to bring in staff who were very skilled at glass production and construction, who could provide the connections between the separate domes and the village.

Donald was asked to work closely with Council staff in determining where the domes should be located, and in preparing the locations for these domes when they arrived. He was elated when he heard from council managers that two of the domes could be available in one years time. This would allow the Professor to ask the

academics to move into the village one year earlier, as their dome would be joined into the village network and their AUs prepared by then. Also, with the purchase of so many domes, they were advised that with a discount their purchases would cost $800,000 less than was previously quoted. This would allow them to purchase an extra dome, which was ordered. That would now be 8 new domes, quite adequate to cater for all their current projected developments, with one possibly extra to allow for unexpected developments. It was decided to add this extra dome to the main village as with all the frenzied activity, and the Professor wanting to bring in extra University research and teaching staff, it would be needed there.

Eli was asked to manage the translocation of the communities into their domes adjacent to the main village. This would include many meetings with the three communities they had contacted to make sure that wanted to move, and in the meantime to bring some of the education and health staff from the main village to these people to help them improve their living standards and prepare for the move which was planned for 2069. Eli was rearing to go.

Heather was also already busy organizing the expansion of the artificial uterus nursery facilities and had ordered another 400 artificial uterus units. Health staff had already requested young residents to volunteer to donate both ova and semen, and this was already in progress. It had been decided that donors should be paid for their donations. These samples were immediately snap frozen and their donors' names clearly recorded. At the same time, she realized that in 9 months time she would be presented with a baby to rear. This made her very nervous, though knowing she would have Donald to help her eased her concerns.

The project to set up the heat resistant algal ponds was put on the back burner for the time being. It was necessary to determine where the domes would be located first, so that the ponds could surround them. After each meeting with Donald the Mayor would invite him to have coffee with her and she would suddenly change from this formidable business manager to his very close friend. He had come to look forward to these occasions, which enabled them both to relax. Once most of the organizing management was in place and working well, she became even more relaxed and asked if he would be willing to spend some nights with her. He quickly consented and they both enjoyed these special occasions which inevitably led to sex. He realized she contributed so much to initiating it and their mutual enjoyment of it. Yet he knew what a heavy load she carried, heading the council and ensuring the project was working well. Considering the large amount of project work they were undertaking this was probably the best way it should be.

Heather did let him know that she would soon be requesting a change in

accommodation to near his, and asked which neighbour might be the best to consult. She pointed out that her current AU was larger than most and had a few extra benefits, so this might encourage one of his neighbours to swap. Donald asked if it would be better for him to try to move next to her current AU, though she said both her neighbours were very old and would be unable to move as they had been so many aids built into their AUs that would be difficult to move. Donald recommended a neighbour who was not so friendly and who he thought might welcome such a move.

Eli's trips to the outside communities proved to be very constructive. They could hardly believe they were being invited to come and live in a dome, with access to good educational and health facilities and at no cost to themselves. They seemed to accept that their dome would be separate from the main village as a good idea, as they would then be able to maintain their independence. The only hitch was when Eli told them they were not allowed to take any form of gun into the village, explaining that the village managers did not want the risk of a bullet severely damaging the dome glass. They were told that could take their guns to the village, though they must be stored in special safety lockers near the entrance gate. Their names must be clearly attached. They were only to be used when they joined the militia patrols around the village. Eli could tell they were very uneasy with this requirement. He tried to explain that within the domes they were totally safe from outside gangs, as the militias patrolled up to two miles outside the Village. They found it hard to believe they could live in a location without everyone having a gun constantly ready for use. He assured them that it felt good not having to need one.

Eli also asked if they were aware how many such communities as theirs existed between their settlements and the west coast of Long Island. They said they were not sure though a wanderer from some of them would occasionally approach their village. This question was not asked because Eli wanted them also included in this transition, though just to plan for the years ahead once the integration of these three communities had been achieved.

Ch 9: The years 2067-69.

These were to be critical years for implementation of the Jane's Hill domed village future plan. Firstly, in May 2067, two babies who were four weeks old were delivered, one to Donald and a second to Heather who by now had moved next door. They had been previously advised that these babies had been delivered full term from their artificial uteruses, and both Donald and Heather had visited the nursery to see their little ones and spend some time with them. They were of course bottle fed with the most nutritive chemical concoction available at that time. They held and cuddled them with feelings of great emotion whelming within them. Donald named his baby boy Julius and Heather her baby girl Bethany. Their robots had been reprogrammed to help look after these two little ones. They had to both admit that they were besotted with them. They were determined to spend as much time with them as they felt was needed to develop the bond necessary for the healthy development of the babies. The babies were kept in close contact with each other, getting them used to being in both AUs and with different robots who of course changed their nappies, bathed them and did most of the time consuming looking after. It was a new chapter in all their lives.

The plan to have all 550 new babies fostered out had worked well. Around 9,000 of the 15,000 residents over 50 had agreed to foster a baby over the next 10 years, and 400 of this first batch were taken by these older residents. Many single women took the remaining 150. A new batch of 550 human embryos immediately began to form their human bodies in the nursery.

The next event in 2067 was the arrival of the first two large domes. One had been cut so that it could be immediately joined to the main village. This was to be the home for the new academics and tutors who would help get the University under way. Twelve new AUs had been already prefabricated and were soon installed. The second dome was to house the University Administration facilities. This was to be separate from the main village, with a number of entry portals built from plate reinforced glass, so that the enhanced cool air was available everywhere in and between the separate domes and they were safe from the wildest weather. The University administration building had modified AUs and was placed between the main dome and where the five new domes would be located, so that it kept students from outside the village separate from those from inside except within classrooms. There they could mix though each one had a special entry key which needed to be used to gain entry and exit.

Prof. Hardinger had been very active getting the new staff into the village and they were welcomed by the Mayor and other members of the Future Planning Committee. He also had already planned ahead for facilities to be available to start

classes once the next dome arrived and had been installed, as it was scheduled to be the teaching area. In consultation with Donald and the Mayor, it had been planned to eventually have half of the students from Jane's Hill village and the other half from outside domed villages as well as close community groups. They all would have to sit some tests to determine that their previous level of education was sufficient to enable them to successfully manage their proposed University courses. Advertisements were sent out within the Jane's Hill village for up to 500 student places to 'start the ball rolling'. The fees were stated, though where students would have difficulty managing to pay the fees up front each year, it was explained that there was a support fund to which applications could be made to provide full or part support to meet these fee requirements. The students who took out these loans would be required to pay them back within 4 years of graduating.

It was accepted that it would be necessary to wait until the New York Bank of the Future dome arrived in 2068 before they could bring 500 outside students in to commence studies in the following year. They would need to live in the dormitory quarters while studying. Even so, starting with the smaller numbers would make it easier to get all courses working effectively and efficiently. They also realized that it was going to take at least a year to advertise on arm cell phones to ensure contact had been made with all potential students from outside the village.

As with local students, fees were the same and the subsidised system would also apply to these students, though they would need to get there at their own cost. The dormitory fees were kept to a minimum as the New York bank donation would be used to subsidise costs of housing and feeding these students in their domed dormitories for the first few years. To ensure these outside students would be ready to start as soon as the facilities were available, the advertisements were sent out around September 2067. 1,400 applications were received, so interviews were conducted to allow them to arrive at a short list of the 500 who would start the next year.

In early 2068 all the remaining domes arrived. The teaching services dome for the University was the first to be installed, then the dome ordered by the bank which would provide the dormitory accommodation for the outside students. It was called the NY Bank of the Future Dormitory Village. These were all interconnected in the way it had been planned, to ensure the outside students could not enter the main village. However, it was realized and intentional that the main village and outside students would all share classes together and thus some mixing would occur. This was to be encouraged.

Eli helped work out the location of the three domes in which the outside communities would be located. There were around 600 people from these three

communities to house, though as previously indicated most lived in the traditional ways within large family groups. Their AUs were specially designed to suit the need of these large families. Eli had in his consultations with them agreed that they would keep the three groups in separate domes though have connecting portals between all. As well, Eli had insisted that portals would also connect these domes to some of the primary and secondary teaching and health facilities.

It would take some time to get it all working. The new residents were so thrilled to be able to live in such protection from the outside weather and heat. They were very willing to cooperate with whatever Eli requested of them. Eli had ensured that they all had immediate access to good clothes, and good sanitary bathrooms. These were viewed as complete luxuries by the residents of the two most disadvantaged communities. What's more, they were now safe from the marauding gangs, though were expected to provide some of their members to help the main Village militias patrol their area. They brought some of their craft activities with them and were able to sell some within markets which developed within the main village. However other forms of employment were also available.

Within the main village, while there was some initial resentment at the disturbances that these changes caused, by the end of the year it had all settled down into a workable order. The original residents were not invaded by the newcomers as some had feared might happen. However, for the majority in all the domes, it awakened some enthusiasm that they were now passing the emergency survival stage and were preparing for a foreseeable future survival. Seeing how these oldfashioned new arrivals lived in traditional family groups began to influence the main village residents to consider trying it out. There gradually were more young couples agreeing to live together and raise a number of children.

For Heather and Donald, it was not long before they both went out pushing their growing babies in wheelless prams around the streets of the village. They hoped they would set an example and soon this was the norm. The older residents who were rearing babies began to do the same. This enabled them to start to interact with each other more and more and exchange their experiences in looking after babies. For Heather and Donald, their joint involvement with each other's children had further deepened their relationship. It was not long before Heather asked Donald if he would be agreeable to them sharing their AUs together including their bedrooms. He was very pleased to accept. He was now able to enjoy the family life he had missed with his former wife. And he absolutely loved these new arrangements. The little ones soon turned one and began to walk a little. They grew to absolutely idolise these little tots, though knew that as they both grew older, it would become harder and harder to look after such little ones. Donald suggested to Heather that they

should ask for a second baby within another few years rather than wait until the children were 10 years old as they had originally planned. Heather fully agreed.

It was so interesting to all the residents to see how the social interaction in the village had so strongly improved. As there was so much more happening and they realized they needed more workers, many businesses ask the Council if they could employ residents from the outer domed villages. This interaction increased so much it was not long before all impediments to these newcomers coming into the village were removed. And it was not long before all the new children and their carers were getting to meet each other in child-care centres. Perhaps it was all the new babies being always visible that seemed to stimulate many young couples getting together and forming a family unit. There was no need for a dating scheme. There were so many children from the new villages that were now coming into the main village, and they were used to this way of living.

Sadly, soon after the second batch of embryos had been placed in their artificial uteruses, Heather received a call from a distraught nurse in the Unit advising her that a large number of the early foetuses were not growing limbs as normally happened at their particular age. Heather asked if she was sure it was not just an unusual delay, though the Nurse advised it was only in around 100 of the foetuses, and in the remainder the normal limb growth was very evident. Heather immediately visited the clinic and found that the Nurse had not advised the Medical Doctor in charge, believing she would be accused of causing this to occur through some negligence in her maintaining the clinic. She took the Nurse in to inform the Medical Doctor, who was absolutely appalled at the discovery, and assured the Nurse she had full confidence in her work being very thorough. They all went in to look at the growing foetuses and sure enough, there was little normal limb growth. They noted that the abnormal cases were all in a row. The Doctor took samples of the uterine fluid from a number of specimens and a few from where normal growth occurred for a thorough pathology analysis. The results showed that a chemical somewhat like thalidomide had been injected into the uterine fluid in the abnormal cases. How could this have happened?

As there were closed circuit cameras throughout the building, knowing the need for absolute security was essential, these were played back. It was only then that they could see a vague outline of a figure dressed in black creeping up to the abnormal units and inject something into these units. Obviously, they had been frightened by a Nurse entering the units and had disappeared before infecting any more. It seemed that the security guard had missed this activity when on duty and later when he reviewed the recorded footage. Why would someone want to harm these foetuses? They considered it was most likely one of the residents who through

a bigoted religious conviction felt such artificial growth of babies was evil, though who had not wanted to actually kill the growing babies. Heather asked the police unit to try to determine who was the culprit. It would be someone who had a very good knowledge of chemistry and access to chemicals, as well as some medical or nurse training. They would be charged with this terrible crime and exiled from the village. However, the big question now was, what do they do about these abnormal foetuses?

As these foetuses had not long completed their first trimester of growth, Heather was of the opinion that it would be best to terminate them. Their survival would result in children being born who would need full time care, and the village did not have the funds or the facilities or personnel to support such situations. However, the Nursing staff and the Medical Doctor felt the abnormal foetuses should be allowed to live with the hope that some of the older residents who had little to occupy their time might be willing to do so voluntarily. Of course they would require extra help from the Council, though this would not be substantial.

The Mayor advised that she would place a message in the arm phones to all residents explaining that due to some as yet unexplained sabotage within the Artificial Uterus Unit, around 100 foetuses had severely impaired limb growth which would result in the babies needing full time care for much of their lives. She advised that their mental development would not be impaired in any way. Would any resident who would be willing to volunteer to provide full time care for these babies for at least the next two decades of their lives once they had been born please contact her office? She asked the medical staff would it be acceptable to only allow the number of the abnormal foetuses with potential carers to survive? They agreed with this solution to the problem. Unfortunately, the police were never able to locate the culprit, so it was necessary for extra security precautions to be put in place around the unit.

The Department for Emergency Survival (DES) sent journalists in from time to time and the Head was continually congratulating the Mayor, the Council and the special Future Planning Committee for what they were achieving. Donald and Eli had started the central Office for Future Planning in the University Administration block, and they employed staff to research just what was happening everywhere else both in the USA and globally, as well as seek innovative solutions to ways to enhance the lives of all the residents. The DES realized that the main village was now growing in population at a fast rate and that their health and education services were beginning to struggle. They allocated another four million to the village council to purchase six new large domes to add to the main central village. As the three outside villages were now so well integrated into the main village life, it was decided to place some of

these domes so as to join these three villages into the main village circle.

Professor Hardinger had done an excellent job of setting up the University teaching programs. The two lots of $500,000 which had been donated to help set it all going and provide dormitory accommodation for outside students were a tremendous help. He had asked for a research laboratory to be made available close to his office in the Admin building. To furnish it he had made some trips back to his old Harvard Uni which was still closed and got permission to rescue much of his old biological cell manipulation equipment, as well as some of the frozen Archaea cells he had stored there. This whole Harvard facility was being guarded as it was hoping it could be reopened one day. He knew it would never be in his lifetime. He negotiated with the current academic caretakers to borrow their DNA sequencing machine until he could gain funds to purchase one for his laboratories, as well as some extra centrifuges and liquid nitrogen storage facilities. This was approved, though he then needed a large electric truck which the caretakers agreed to loan him to transport this equipment to the Jane's Hill village.

After setting up his research lab in the University Admin centre he had successfully inserted the heat resistance genes from some of the old Archaea cells into some extra types of algae cells. He achieved this by attaching these heat resistant genes to a benign virus that could be used to transport the new DNA into the algal genomes. This method was based on the CRISPR gene editing system developed by two female scientists in the early 2000s, for which they shared the Nobel prize.

These algae normally lived in the shallow part of the oceans and rivers. His experiments which involved placing them in a sea water culture had shown them to be able to tolerate the temperatures outside the dome. This was a great start. He then transferred some of these genes into the seeds of a number of trees that had not been able to tolerate excess heat. This was an attempt to see if they could grow in the 6.8^{o}C heat though they were normally slow growers and had not yet shown any tiny buds. The Professor had already planned where the moat of heat resistant algae ponds could grow and was employing many workers from the outside villages to dig the holes and lay the clay base to ensure they held water. It would take many years to complete. However, he knew they would greatly contribute to the future success of the village.

A further research section he set up was an 'Earth watch' group. Their task was to keep a close eye on the composition of the atmosphere, global average temperature levels, find out what was being done to combat increasing carbon dioxide and methane levels and determining how effective these methods were. They would also try to develop other ways to reduce greenhouse gas levels.

Yet another task was to determine the main effects of sea level rises on coastal

communities and how these could be best managed. For example, through their arm phones they received messages from those people living near Lake Ontario that the four metre rise in ocean sea levels had resulted in a one metre rise in the St Lawrence River system at Niagara Falls. The water had inundated lowland levels of the river and Lake Ontario, forming new inland lakes. The same had happened with the Hudson River, though fortunately the increased levels of water near its mouth had not penetrated up to Albany and affected the Eire Canal. They decided they would send drones up to enable them to determine more precisely where these new areas where which were now covered in water.

The Council and the Future Planning Group asked to be informed of their findings in all these areas. A monthly briefing session was organized. The first report indicated that the average global temperatures were still rising though not at the previous rate. They were now 7.2^{o}C above preindustrial levels. The CO^{2} levels in the atmosphere were now 13.9%. It was evident that they would still need the protection of domes for a long time.

Prof Hardinger had also warned them that it was unlikely that the levels of CO^{2} could be radically reduced quickly unless they could develop heat resistant trees or other plants with lots of green leaves. He pointed out that the last time the Earth had experienced this degree of temperature rise in the Permian era around 250 to 300 million years ago, it took around 200,000 years for the temperatures to revert to what we call normal. However, he went on to say that ‘we have invented ways to hasten this process, though even with these working at full potential it will most likely be hundreds of years before the human species, if it survives, can live out in the natural world in the way that it had previously. Nevertheless’, he continued, ‘we are making a good attempt to survive and we are gradually learning how to not only survive but also contribute to our long term survival’.

Eli was keeping a close eye on the outside new villagers. He was treated like a King when he went there, though he asked them just to treat him like a colleague who wanted us all to survive and have a good productive lifestyle. From all his observations, they were all thriving and just so grateful for the opportunities with which they had been provided. There was plenty of work, and they now had been fully accepted as equals within the main village. Their children in particular were just revelling in the opportunities for advancement available to them.

One piece of information Eli had received from some of the new residents who had joined the security militia was that it appeared that the three gangs that were present on Long Island had moved into the old lodgings of the three communities that had abandoned them and were trying to survive there. It appeared that their abilities to survive by raiding trucks and settlements were less and less successful. He

wondered whether offers of help might turn these people who were only humans trying to survive into law abiding citizens.

He put these questions to the Planning group first of all. This put the cat amongst the pigeons. It certainly provoked a long period of discussion. The Mayor with her usual skill in leading the discussion asked was it time for them to step back and re-consider what their main aims were as a Village. It had been initially long-term survival, then progressed to planning to improve their quality of life. Should they now also try to rehabilitate those who had been their main adversaries? Another question they were led to consider was 'what was the maximum size the village could reach and still maintain the vibrant interactions that were currently making it a great place to live'.

Even so, the Mayor was particularly interested in Eli's suggestion that they approach these former gangs to ask if they would like some help. Her thought was, if we could get rid of gangs by converting them into functional, stable communities, we would not require such great involvement and cost in sending out militias to protect ourselves and other domed communities. A number of the group thought it too risky to approach them. Eli offered to lead a well protected attempt to do so, by approaching the new communities with a large white flag, and large signs asking could he talk with their leaders. Even Donald was a little concerned about his friend's safety, though knew Eli was so dedicated to seeing that all remaining humans, no matter what their reputations were, have a chance to develop into productive, cooperative communities. The Council approved Eli's request in principle though asked him to delay any attempt to approach the gangs until the Council discussed the matter and provided its approval. It was considered that these new communities might need a considerably longer time to prove their intentions to settle down and change their old ways.

This time of introspection had Heather, Eli and Donald spending many hours asking themselves what had been achieved in their village and why had it been so successful. Eli was now also on first name terms with the Mayor and had become very aware of the intimacy between her and Donald as soon as she moved to live next to him. He became so intrigued to see them both settling in and behaving as an old married couple with children.

Donald in particular pointed out that what they had achieved was so superior to what the lifestyles were over 40 years ago. He almost called their current lifestyles idyllic in comparison. They could live without fear of gun atrocities. They had no illicit drug problems, no heat, hailstones or tornados. They had such an egalitarian level of opportunity to develop productive yet less stressful lifestyles. There was hardly any crime in the village, and where it had occurred, it was often found to be caused by

residents with mental health issues, and the perpetrators were helped to redeem their actions. It was made clear to the residents that all types of religious belief were accepted within the village, so long as there was no open harassment of other residents to join them. An orchestra had already begun to practice together and would soon be providing performances. Also, a music club had formed with view to presenting some of the old musicals. A dramatic society was practicing some of the latest plays that originated before the climate crisis hit. And a few of the residents were writing new ones to try out. These inevitably related to their current situation so were very welcome.

After much discussion, the Future Planning Group had come to a decision to try to eliminate as much of the more severe categories of psychotic mental health as was medically possible within the village. It was decided to try to attract the top neuroscientists and more molecular geneticists to their village to continue the genetic research into which genes contribute most to bipolar and schizophrenic disorders and see if it was possible to scan for these genes in the ova and sperm samples they were collecting. These samples could then be discarded, or if possible, have these genes replaced by the CRISPR gene replacement techniques Prof. Hardinger was using to produce heat resistant plants. It was realized that much research into the genetic basis for these common psychic disorders had been well underway before 2045, though it had all discontinued when most of the Universities and research institutions had closed down to allow their researchers to return to help their families survive the climate crisis. So, they had a good supply of information available to provide a 'kick start' this project.

It was Eli who was a little disturbed with this decision, thinking back to his reading of Hitler's attempt to produce the 'perfect' human. However, Heather very cleverly pointed out that they were living in very different times, and this did not involve killing millions of humans which were considered imperfect as Hitler's regime had done. In this case, they all realized that it was not pleasant to live with these mental disorders, particularly in such densely populated communities as in their village. If they had the mechanisms to remove the genes causing these disorders, it would help with their aims to ensure every surviving human had the best and the same opportunities for personal development as everyone else. Her argument won the day. Yet again they asked the DES for financial help to achieve these aims. This Department had been so impressed with what the Jane's Hill Village had achieved, even though these were somewhat unusual requests, they agreed to provide the funds for extra dome housing required and the other costs involved. It was evident to the Dept Head that they were already making this an exemplary community which fostered cooperation and equal opportunity as their main focus.

What had occurred within this village was the antithesis of what one might have expected. It took this threat and fear of annihilation to result in a total reversal of life-styles compared with the extremely stressful, highly competitive times Americans had experienced in the 2020s, politically, socially, racially, economically and ethically. The residents all had to put up with living in an artificially protected environment with few natural clippings, though the fact that this had enabled their survival had in many ways brought the residents together more than the highly competitive conditions that caused so much stress before the main climate events began to occur. However, they also had to ensure it continued to give them the protection and lifestyle they had been able to achieve. Heather often longed for the natural environment she lived in before the climate crisis, though believed that would not be possible again in her lifetime.

Following the Council's decision to proceed with the approach to the gangs, Eli was given the green light to proceed in his attempt to communicate with them.

Chapter 10. Reconciling the gangs.

Eli set out with more than the usual support vehicles towards the first of these three ‘gang’ communities. However, he asked the support vehicles to remain well back so they could not be seen while he went alone with a large white flag and a large sign asking if he could talk with their leader and declaring that he was not armed. Some of their group with rifles came out to ensure he was not armed and conducted him into the village. He was asked what he wanted. He pointed out that he was from the large domed village where around 45,000 humans currently lived peacefully. Eli told them those people living in the domed village realized that the gang members were only trying to survive, and that it was difficult to do so outside a domed village. Could they offer you some help with health problems, with educating your children, or even with food? The leader asked ‘why would you want to help us when we were your enemy?’ He pointed out that the domed villagers were all survivors in the same way that they were, and that only 1 in 10 Americans had survived so far. It was just that the domed villagers wanted to help any remaining humans to also survive within their current locations in any way they could help.

The leader advised him that they were terribly short of food and safe drinking water. Those were their greatest problems. They also had no teachers who could educate their children, and many children died from the many viruses. Eli said that he would return with food supplies and water immediately. He thanked the leader for allowing him in to talk about these problems.

He retreated to his support group with the good news that they seemed willing to be helped and explained that there was an urgent need to return with some food and water supplies. His immediate thought was that it might be best to try to make contact with one gang first and use it as an example of what could be available to the remaining gangs. He did return immediately as he had promised and with only one support vehicle. The looks on the faces of the ragged, decrepit residents when he brought in a good supply of food and clean drinking water was something he would never forget. They just could not believe that he would honour his promise and were so grateful. He explained that he would bring a few teachers and health workers in two days time to help them improve their living conditions. He assured them that these workers did not carry guns. In fact, he told them guns were not allowed in the village. ‘What’, they cried, ‘how do you resolve your disputes.’ ‘By sitting down and sorting them out between us’, he said. He pointed out that all the residents in the domed village agreed to help each other rather than compete with them. They could hardly believe this could happen. ‘They sound like a lot of weirdos’, said the leader of the gang to his fellow members. Even so, they were very appreciative of the help.

In two days time, Eli arrived with some teachers and nurses. He only had one

support vehicle and the teachers sought out the children to talk with them and generally ask how they were surviving. They were very distressed at the condition of many of the children. The leader's oldest son, a boy around 12 years of age, they found particularly receptive to the offer to start learning to read and write. They promised to bring him some booklets to help him start as well as some new clothes for the children, many of whom were just wearing rags. The nurses also spent a lot of time with the children and realized it would be a good idea to begin a program to immunise them against the most common bacterial and viral diseases. By this time in history, vaccination was applied by patches or orally, so there was no fear of injections.

Many of the women and even some mid teenage girls were pregnant, though the Nurses were informed that many died at childbirth. The nurses tried to find out how far any current pregnancies had progressed and planned to bring a doctor and midwives when deliveries were due. They gave the leader's wife an arm phone as none of the residents had one and taught her how to use it. They asked her to send them a message when any of the pregnant females started contractions. The teachers and nurses ensured they kept their promises and gradually the gang members had to agree that these people were genuinely trying to help them. They still could not understand why.

The leader's son was very intelligent and very quickly learned to read and write. His parents were not sure why he wanted to do so, though found that many of the other children also wanted to learn. And it was so good for the females to now mostly have trouble free deliveries of their babies. Also, the nurses would come frequently to ensure the babies were healthy and surviving. Gradually the community residents came to see there were many advantages in the way these odd people lived. It was not too many weeks before the other two gangs sent a message through this gang leader that they also desperately needed help.

Again, Eli followed the same approach, and offers of help were gratefully accepted. Even though this project required a lot of resources, the village managers found that they could now cut the numbers of militia down to a bare few. These wandered around within a few miles of the village, their guns concealed, acting just as wanderers, to ensure there were no individual vagrants who might want to raid the village. These former militia were trained in other occupations at the University, and they all soon had alternative employment opportunities.

By 2073, four years after their first contact, Eli believed it was now time to invite these former gang communities to come and live in a domed village near the main village. He felt strongly that all the gang members had clearly demonstrated that were really wanting to live like those in the domed village did. The members had

all benefited so much from the help given by the domed village workers. A further request for funding for domes from the DES was successful, and an order placed. Fortunately, one was available later that year, and it was planned to invite the first gang to move in during the following year, 2074. At first there was a great deal of hesitation by the gang leader to accept the invitation. It was the first gang leader's son who worked hard to persuade his father that they should accept the invitation to locate into such a new way of life. All the females also urged the leader to accept the invitation. It was hard for the leader to do so, but he had to agree that these visitors had done an enormous amount to help this people. He was concerned that they might be forced to change their lives so radically that they would regret having done so. Eli advised them that no guns were allowed in the village, though they could store them in safety boxes at the edge of their dome. They were particularly concerned about this though the older son pointed out to his Dad that they had not needed to use their guns since they moved into the old community structures. He explained that their guns would be there nearby if ever needed, though that they were the main reasons why other people had guns, to resist their attacks. Finally, the majority opinion was that they agree to move into a dome.

The other two gang communities said they would rather wait to see how it worked out for the first before they decided to follow. The first decided they would move into a dome with the condition that they could remain separate from all the other groups. Eli asked if they were happy to have their children attend school with other main village children and also have their people attend health clinics staffed by the same people who had visited their village, it being organized so that they did not actually enter the main village. They seemed happy with that arrangement.

The big day arrived, and multiple electric vehicles came to help them and their few belongings move with them into the new dome with its multiple AUs designed to cater for large families, as had happened with the previous migrants. They were somewhat overcome when they found they could breath the air inside without any effort, and were also amazed how less hot it was. It was unusual to be enclosed, though their dome had so many transparent sections they could see outside to a number of lush green algae ponds covered by transparent glass plates, and the sky above. They had not seen anything so green for such a long time. Also, by this time, some of the Professor's heat resistant trees were around two metres in height. These newcomers could also see at a distance into the large set of domes and noticed these cocoons that floated in the air. Their dome had not been provided with these methods of transport as it was not really needed, and also it would make the transmission more complicated. It was not long before they asked if they could have a few, just for experimental use in their dome. Fortunately, the central Emergency

Survival funds allowed for these expenditures, including the placement of the apparatus enabling the electromagnetism to function. The DES staff were particularly keen to see how this experiment in rehabilitation of a gang would work.

The older teenagers quickly learned to program them and were keen to give their parents a ride, one at a time only fitting in with the driver. The children really enjoyed going to school with some of the main village children. Being children, no one was concerned that the parents of these new friends had been gangsters. Also, the adults gradually became used to being able to go to the health centres to collect medicines or for pregnancies to be well monitored, and natural deliveries of babies to be safely carried out.

It took another year before the two remaining gang communities agreed to move, assured by the first group that it was very beneficial. They had to learn a new way to live though the opportunities for paid work and education for their children and good health services were such a good change and provided so much a better lifestyle. Also, it was not too hot, they did not have to hide from heavy hailstone storms, and they could learn to travel using these strange new contraptions. It was a major event for the village. The Jane's Hill domed village had been able to demonstrate that it was possible for the gun toting gangs to learn that they could live a much safer, healthier, predictable yet stimulating life with their children being freely educated and have plenty of jobs available.

The son of the leader of the first gang community would soon be accepted into the University to study engineering. He was a great example for the other children and within another four years the gang villagers were freely integrated into the central village as had happened with the first lot of outside community imports. The council received many requests from other domed village managers to tour their village and hear how they had achieved such a vibrant and peaceful large community of humans. However, sadly, there was suddenly a major threat to this success.

One of the children from the second gang to move into a dome asked to talk to Eli. He said he had overheard three of his gang members plotting to raid the main village gun store with guns that they had hoped to retrieve from their own dome gun store, and with these take control of the main village. Eli was very disturbed by this news though knew that each gun store and each entry point to the main village were heavily guarded by armed militia. However, any gun fight near the domes would be catastrophic. He asked this teenager if he was willing to request to play with their children and could he place hidden listening devices in their AUs. He was aware that all the gang members had been issued with arm phones when they entered their domes, though that they could easily discard these when conspiring. The lad agreed. Eli was able to gain the evidence that this conspiracy was indeed occurring. He asked

the Mayor for police to enter the dome and arrest the three gang members involved.

A hasty court was put together with Eli as head prosecutor, and the new Law Professor as Judge. Eli was not your usual prosecutor. His aim was to find out why they had planned to destroy what had helped their gang members gain so many advantages by this move into the dome. It soon became evident that the three men suffered from a type of severe mental deficiency. They were three brothers within a family, all with the same mental deficiency problems and had become so used to gang warfare that they had this urge to carry out the type of actions that had been so normal in their former way of living. They had no idea what they had planned to do in the main village. It was not their intention to destroy it, just capture it.

The former leader of their gang was very embarrassed by the actions of these men and apologised very profusely to the court for their actions. He advised the court that he was aware of their mental deficiencies though had not expected them to even consider such an act. He advised the court that he would personally counsel them and maintain a constant watch of their activities if the court would allow them clemency. He also assured the court that there were no other gang members with these mental health problems and that his gang members were all extremely appreciative of what the main village had done to help them.

The Judge adjourned the court and called on the gang leader to meet with him, Eli and the Mayor. They were of the opinion to grant clemency though wanted to have a medical psychiatrist examine and treat the men over the next few years. They were also wanting an assurance that the leader would keep a constant eye on the three men. He fully agreed with these requirements. He also agreed for their dome's gun store to be relocated near the main village store though still be kept separate.

The court gathered to allow this judgement to be read. The three men were ordered to be placed under guarded supervision in the health care centre for a week while a medical psychiatrist examined, assessed and treated them. When the medical staff felt they were safe, the three were placed in the charge of the gang leader and returned to their dome. Even so, this episode led Eli to visit the three former gang communities more frequently and maintain a strong communication with them to ensure no further such episodes suddenly developed.

The molecular genetic scientists took three years before they could definitely identify those genes in ova and sperm which increased the risk of children eventually developing bipolar or schizophrenic disorders. It was agreed that it would be best to remove these genes where they were found in samples of donated ova or sperm and replace them with what they called 'normal' genes. This was a huge breakthrough, and it was agreed to monitor these changes in new born children. However, as so many more residents were living in family groups now and some women wanted to

give birth naturally, they offered to test samples of male and female reproductive cells prior to conception for such risk factors. This was welcome and during the next decade it was noted that the numbers of residents with these mental health problems within the Jane's Hill domed village declined markedly. However, there were the occasional signs of other psychopathic problem which caused disruptions to village life and the psychiatrists and scientists set their sights on reducing the risk of these problems also occurring.

Ch 11: 2074.

Heather and Donald were now 70 and they really enjoyed having two 8 year old and two three year old children. Of course, the robots did so much of the difficult chores though they both had managed to spend a lot of time with their babies, watching them grow and really being loving parents to them. Heather had finally decided to celebrate the occasion by asking not to continue as Mayor, and Eli had agreed to put his name forward. He was extremely popular in the village and even though also in his 70s, he had not raised children and still seemed to have a lot of energy. He was elected and continued to ensure that the village remained true to its original aims. The only problem of any significance was that their population was approaching 70,000. It had been agreed that 100,000 was the maximum size that they could manage with the support facilities and resources available. He led numerous discussions with village elders and the younger adults as what should be done to deal with their rapidly increasing numbers.

Some of the younger, more adventurous types agreed that they would like to set up another similar domed village up near Lake Champlain. This was a particularly beautiful region of the old New York state. Quite a number of the younger residents opted to do so, agreeing that they would follow the recipe for Jane's Hill domed village set up in terms of the basic organizational system. The older residents realized that there were now somewhere near 15,000 70+ year olds in the village, which was slowing things down somewhat. Heather and Donald knew they were slowing down, though the last decade had provided such a wonderful life for them, and they knew that they may have only another decade to live.

In the meantime, an enormous amount had been happening at their village and globally to try to reverse some of the changes in climate that had taken place. Prof Hardinger's experiments placing heat resistant genes in seeds of some of their favourite trees that had previously all died from the heat, had worked. He had now grown many to around ten metres tall. The whole extended village now had these trees planted all around it, and the residents really enjoyed being able to see some of these natural plants slowly forming a forest surrounding the village. Orders were coming in from around the world to buy some of these seeds, so with a grant from the bank the Professor had set up a large commercial business which was owned by the University and was employing 240 residents, mainly from the former outside communities. They had purchased extra domes to run the business. He was also expanding the technique into other seed varieties, especially those with large green leaves that soaked up CO^2 and turned it into sugars, releasing oxygen into the atmosphere at the same time.

Other biology research groups had followed suit, and this had become a major

global business. As well, other scientific groups and companies were producing more efficient removal systems to extract CO^2 and methane from atmospheric air. There were now over a thousand of these around the world. By 2078, the amount of carbon dioxide in the atmosphere was down to 10.8 %. It was happening, but slowly. It was forecast to be down to 8.3 % within another decade. However, the average global temperature had crept up to 8.3C^{o}. The violent weather patterns continued. It was expected that these would take a few centuries to abate.

It was also known that the Earth's human population which had been estimated to have dropped to 0.9 billion, was now increasing, even though slowly. Life in the village was an example of how these numbers had grown. There were now 5,600 children compared with 700 in 2065, including the large numbers of children from the outside communities, though these numbers were well below what they had aimed to achieve. Even so, they were increasing sufficiently to ensure human survival. As well, work opportunities in the village had grown exponentially, and the newcomers were all employed and earning good money. Family numbers were increasing rapidly, as were natural births.

Residents within the domed villages were kept up to date on all the new advances and the opportunities they provided, while still remaining gun, illicit drug, smoke and crime free. As the former gangs had now become reconciled to a new way of living, it was agreed in the mid 2080s to destroy 90% of the stored guns, as they had not been used for the last decade. By this time, almost all American survivors were living under domes. Most residents had realized they would be confined to their domed villages for the foreseeable future, though that there was little threat to their existence from other humans due to the major difficulties still affecting travel.

At the state level, the old Dept of Emergency Survival had by now been changed to the Dept of Forward Planning. It had been recommended, following the example of the Jane's Hill experience, that it was important to limit the population in each large village to 100,000. Increasingly many vegetables were being grown on AU roofs in many villages and most had set up heat resistant algae farms. These provided a treat to replace some of the manufactured proteins, carbohydrates and lipids with taste additives. Overall, humans were starting to feel they might now be able to save their species from extinction.

Ch 12: 2084-2100. Humans had demonstrated what a resilient species they were.

The year 2084 was a sad time. Heather had just turned 80 when she developed a series of extreme headaches. She was diagnosed with a rare type of brain tumour which was not responsive to the well established T cell treatment that reversed Donald's cancer. Sadly, she passed away during mid year. She and Donald had for the months before her death enjoyed a great time reminiscing on all that they had been through together. Their children were extremely sad, two being 18 and the younger two 14 years old. Donald spent so much extra time with them to help them grieve safely. He asked Eli would he be a close Uncle to them, and Eli had accepted that responsibility and fulfilled it well. Even so, Eli was now also in his 80s, though still behaved and appeared as if he were 60. He acted as a mentor for the older two and would take the younger two on tours of Long Island. It was now safe to do so without any need for protective support.

He made a point of discussing with them the tremendous changes that had taken place over the last 60 years, and how their Mum and Dad had contributed so much to making the village what it was. He made sure that they knew that it had been their Mum who had organized the initial purchase of the domes and oversaw its construction using the multiple sets of domes over 30 years ago.

Donald was the one to grieve most. He now spent almost all his time with the younger children. He had recommended to Eli that Heather's name should be remembered in a special memorial. This was located in the central village square, with a history of her involvement with the village written in clear letters. He, Eli and all the children were so proud when it was unveiled. However, it was not long before there were thousands of small flowers laid on the memorial with cards from so many residents who realized she had played such a major part in their survival. The square was renamed Heather Square.

Eli continued as Mayor, and there were continuing challenges to be met. By this time, the levels in the atmosphere were down to 8.4% and falling. There were now so many heat-resistant plants, including trees being grown around the globe that were sucking up the carbon dioxide and releasing oxygen. Teams of workers had been organized to plant these in the Amazon and Borneo jungle areas over the next decades. As well, Prof Hardinger had implanted genes to provide heat resistant and acid proof plankton, and these were being spread around the globe and were beginning to help the oceans absorb increasing amounts of their CO^2 to make their shells. His heat resistant algae were also flourishing in more shallow waters.

The CO^2 suction filters were also removing quite a large amount of the carbon based greenhouse gases. The temperatures outside the domes remained at the high level of 8.3 ^oC above the previous levels. It would still be many decades before they

were anywhere near what they were 100 years ago in terms of a liveable natural environment. As well, the continuing heat helped keep the violent weather patterns going and it was still necessary for most humans to live under a good cover that kept them cool and safe. Many of the older 15,000 residents of Janes Hill village were either dead or would not last much longer. The Council was asked to provide for the children that they had been rearing, and there was a sudden need for more carers. Large numbers came forward.

Then in 2086 it seemed that all the Earth's tectonic plates were starting to move more rapidly all at once. There were major earthquakes followed by many tsunamis around the globe, and several major volcanic eruptions poured billions of tons of ash into the atmosphere. This ash layer ended up covering the whole planet, stopping the sun's rays getting through to the earth's surface for two whole years. Every plant stopped growing. Everyone living outside domes was advised to stay inside and seal doors to stop inhaling ash. The temperatures remained fairly steady though still very hot. The planet almost came to a standstill. Fortunately, those humans who lived in domes were able to escape the ash, though it built a layer over the domes. Eli had to bring in helicopters that could first blow a lot off with their blades and then douse the surfaces with water. Their algal farms were covered by glass though without sunlight not much action resulted in carbon capture. The council had to revert to bringing in extra of the old, manufactured nutrients to ensure food supplies did not run out. Extra lighting was available through the nuclear power supplies. It was a very difficult two years. However, the village survived due to the action of Eli and the Council.

In 2090, Donald passed away suddenly. He still was determined to maintain a stressful exercise regime and one day his heart could not cope. However, he knew he had had a good innings, and it was inevitable that his time would soon end. He had lived to see two of their four children marry and begin to have families of their own. They had learned from their elderly parents the joys of family living and were determined to continue with this old tradition. In fact, this old tradition was now becoming so popular, and many women were even prepared to endure the trials of natural birth.

For Donald, having seen his first grandchild was something he never dreamed was possible and it had given him such pleasure to have grand-children sit on his knee and look into his eyes. Thanks to Eli he still had around three million dollars in the bank and after leaving a million to be shared by their children, he left the remainder to the University which he had helped get established around 23 years ago. Eli had by now retired as Mayor, though was determined to see that Donald's name and generosity was remembered. The University had grown so much since its

early days and was now producing some of the world's greatest advances in heat resistant flora and the regeneration of some of the fauna that had become extinct. They were now also leaders in reducing the amount of genetically based mental illness. Also, the son of the first gang leader they had helped join their village became a Professor of Engineering and had contributed so much to helping the village expand its infrastructure that he was voted in as the next Mayor. Both he and Prof Hardinger who was still working at 90 years of age used this donation to greatly expand the facilities and staff expertise at the University. They named the Administration block the Donald Benroth Centre, and a large plaque outlined the enormous contribution Donald had made to the University. A number of other Universities had been established in other states, though most of the old traditional Universities still remained closed.

It was only three years later that both Eli and Prof Hardinger passed away. Their legacies were also well remembered and celebrated. The Mayor in particular knew that all the gangs owed their reconciliation and regeneration to Eli, and had also become aware of his close involvement in helping the village plan and achieve a great future for all its residents. He organized for an appropriate memorial statue of Eli to be placed in Heather Park with a record of his contribution attached. Prof Hardinger had achieved world renown for his tremendous contribution to helping reverse so much of some of the damage that the extreme climate change had brought about. His name was given to so many parks that now were full of the heat resistant trees and shrubs that he had enabled to grow. Within the University a huge obelisk was erected recognising that he was the one who set up the University staffing to enable it to commence around 30 years earlier and recognising his great contribution to the sciences of biology and molecular genetics. The History Department of the University made it their major focus for the next decade to record the whole progression of the Jane's Hill domed village from its foundation in the early 2000s to the present time. This record was published in 2100. In particular, it mused over the fact that it had taken an existential crisis to change their mode of living in at least one state of the USA from the very divided, competitive, stressful days of the early 2000s to a much more relaxed, supportive, cooperative society for the few survivors of severe climate change. Through immediate survival necessities such as the need to ban guns within the domes and smoking which polluted their fragile artificially regulated air supply, and illicit drugs, they had been able to establish such a progressive, safe, stable place, relatively crime free to live in while employing a more cooperative form of capitalism as their *modus operandi*. It was recognized that they had desperately needed guns to get to this stage, allowing the militias to overcome

the gangs, though with the reconciliation and rehabilitation of the gangs, guns were no longer necessary at least in that part of the globe. Certainly, there were still the anxieties and other emotional problems present though the village had made readily available very able counsellors to help residents learn to deal with these conditions. The fact that it was such an egalitarian society, with plenty of opportunity made available for constructive work and financial reward for all the residents, that helped maintain it as a very cooperative community. In fact, the whole of the USA had changed in every way. There were now only 15 states, with a greatly reduced population in each. It was the introduction of domed villages which enabled them to survive to cope with the catastrophic conditions they were all facing. Politics were no longer helpful in the attempt by the remaining Americans to survive. And many of the residents of other domed villages had followed the lead of the Jane's Hill domed village and began to fight not only for the longterm survival of the human species, but also had developed as very progressive communities.

The history academics were also aware that many residents of these villages had recognized that the old democratic system for election of governments in the USA was very flawed and was threatening the existence of democracy in that great country just before the climate changes increased. They had all agreed to urge their Mayors and through them the new State Governors to adopt a system with proportional representation and compulsory voting, once conditions had improved enough to permit elections to be held. When all their Mayors got together via the internet, they agreed to try to have this accepted state wide for the whole country as a long term aim. They also strongly lobbied for the old constitution to be upgraded to relate to the new situation the whole country had found itself in. The old constitution was totally now out of date. Their justification to change this sacred document was that the USA as well as all other countries had almost been destroyed by extreme climate change. The small number of American survivors were now determined to have their beloved country rise again to become the great nation it had been. However, the conditions they had to cope with were so different from those the original pioneers were facing. The new constitution would take account of the current situation. It would be called the 'Mark 2' Constitution.

Worldwide, other countries were also just beginning to cope with the same disasters and the continuing excessive heat and weather, with just a few remaining humans struggling to survive. Some had lost so many of their population and resources that they agreed to have more prosperous countries adopt them at least on a temporary basis to help as many of their people survive as could be achieved. All were also considering new ways to organize themselves, recognizing that they still had the extreme heat and weather to deal with into an unknown future, and the

prospect of another terrestrial shake up to deal with any time. It was still a scarry situation globally, though so many of the remaining humans were demonstrating just how resilient a species they were. They were increasingly prepared to face the unknown future, and whatever further challenges nature would throw at them. The fact that they were no longer damaging the atmosphere was a great start.

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Malcom and his wife, Lorna are very strong supporters of action on climate change, and this sci-fi account was written in an attempt to help convey what the worst case example of climate change might be like as experienced in a part of the USA which Malcom and his family came to explore during a sabbatical year at the Eastman Dental Research Centre, Rochester, NY state. However, it was also intended to show how human resilience could help our species survive.

Bio. J Malcolm McIntyre completed his training as a Dentist in Brisbane, Australia, in 1960, then completed a PhD in Microbiology and Immunology at the Adelaide University Medical School in 1969. He then spent a year studying communication between biological cells at a Max Planck Institute in Germany. Malcolm then joined the Dental staff at Adelaide University in 1978 and spent four years as Dean of the Dental Faculty. He was asked in 1997 to help set up a Dental School in PNG, which had a population of around 8 million, with only 7 locals mostly trained elsewhere trained as Dentists remaining. Over 150 Dentists have now graduated and ensured there are workable Dental clinics in most of the 22 Provinces. He also spent much time volunteering in the Solomon Islands and Vietnam. His many unusual experiences have been described in a book titled, 'Diaries of an unconventional Dentist'.

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