

The Last Outpost

2125 A.D.

by Fleataxi

Chapter 1

Lunar Colony Alpha Prime was tunneled deep into the crust of the moon using advanced technology, which resulted in walls that were capable of sustaining pressures of over 2 atmospheres. They received electricity from a constellation of massive satellites with huge solar panels that converted the energy to electricity, and transmitted it to the surface using tight-beam microwave transmitters. The lack of lunar atmosphere allowed them to achieve 95% efficiency transmitting energy to the surface from lunar synchronous satellites. They had an emergency backup atomic power plant left over from the “bad old days” out of a scrapped US nuclear submarine in case something happened to the solar power plants, which had an estimated life of more than 100 years.

500 men women and children currently lived at Alpha Prime. The children were born on the moon, and were accustomed to the low gravity. The downside of that meant that they could never return to Earth, since the Earth’s gravity would kill them. They grew their own food, manufactured oxygen and hydrogen fuel. They mined the moon for valuable minerals and raw materials to build more structures. Over the decades, the Lunar Colony inhabitants stopped thinking of themselves as Earthlings, since they couldn’t return to the Earth after living on the Moon so long, and their kids could never set foot on the Earth, or even enter its gravity well.

Life underground on the lunar colony was little different from life on the Earth, with the exception of the Sky. Anyone on the surface of the moon looking directly at the sun without the appropriate filters would quickly damage their eyes, and the space surrounding the sun was deep black inkiness. On the “dark side” of the moon, they had a huge radio telescope and the largest electro-optical telescope in the Solar system. Scientists on the Dark Side were making new discoveries in Astronomy and Physics at a pace that frustrated Earth-bound scientists. They had increased Man’s knowledge of the universe billions of times since they had established the research center on the Dark side. Like the other inhabitants of the Colony, they could never return home, yet there was a 20-year waiting list to get an appointment to the Lunar Observatory, so the best scientists in Astronomy and Astrophysics were the ones lucky enough to go. Several teenagers in the colony served as assistants and apprentices to the scientists. The Hubble Space Telescope had lifted the curtain, but the Lunar Observatory removed the curtain, and cleaned the window until it gleamed. Once the data from the Lunar Observatory started reaching Earth, all previous Cosmological Theories except Intelligent Design were quickly set aside. The Universe was several billion times bigger than previously thought and except for stellar noise and other radio signals from known sources, like X-ray stars, it was quiet as a

tomb. If ET were trying to get hold of Planet Earth, we couldn't hear them. Scientists quickly became at least Deists, and most became Christians.

WWIII in 2025 was the shortest war in history. China and North Korea tried to launch a pre-emptive strike at Russia and the US. Our Space Defense system worked just like it was supposed to, and vaporized the warheads in flight. Russia wasn't so lucky. Russian and American sub-launched cruise missiles with neutron warheads killed half the population of China, and wiped out North Korea. The new clean warheads had no fall-out, and were designed to kill people, and worked exactly as they were supposed to. The new Chinese Government decided that since half the Chinese were dead, the living could now have two children each. President Affleck shook his head. Even after a major disaster, the Chinese wouldn't abandon Population Control. Vice President Gooding thought they'd never learn. The upside of WWIII, if there was one, was that the International Federation of Scientists realized that we WERE dumb enough to exterminate the Human Race, and decided to accelerate plans to make a permanent moon colony as a Last Outpost for Humanity. They never discussed their true reasons for the colony, and justified it based on research and manufacturing. They discovered that certain manufacturing processes conducted in low gravity resulted in near perfect components. With lunar gravity about 1/6 of Earth's, it was the perfect base to manufacture several high-precision components, including perfectly round ball bearings, faster computer chips, and various heat-resistant polymers. What set the world on its ear was the proposal to build Big Ear, an array of 100 2-mile wide radio telescopes that could only be built on the moon, since they used existing craters to form the reflectors. With the mass of the moon shielding it from Earth's radio pollution, it was infinitely more sensitive than any earth-based radio telescope, and detected radio signals from quasars billions of times farther away than previously thought. With the size of the known Universe expanded several billion times bigger than previously thought, the Big Bang theory was basically disproved. Pictures sent back from the opto-electronic telescope which had a mirror 1-mile in diameter made Hubble's images look like someone with an Instamatic Camera taking a picture of Venus surrounded by the lights of New York City.

In Alpha Prime, the "garden" was not only their source of food, but it recycled all waste and water, and converted the Carbon Dioxide exhaled by the occupants into oxygen and water vapor. The garden was laid out like a city park, and included huge expanses of green grass and trees. Sunlight was admitted into the garden Solarium through special UV filters, and provided an artificial "sky" 200 feet above them, which was high enough to safely play baseball and football on the grass field. Lunar soil proved to be an excellent hydroponic media, and an advanced waste recycling technology converted all their waste into nutrients that were absorbed and used by the plants. They were so good at recycling waste that several shipments from earth were nothing more than biological waste products that had been sterilized for safety. In case their water production plant failed, they had millions of gallons of water stored for emergencies. While the low gravity allowed for lakes of open water or pools to form inside the pressure domes, the Council had decided that large bodies of open water weren't worth the risk.

Every 28 days, Alpha prime would turn from the day side to the night side of the moon. The Dark Side was a misnomer, it got sunlight as often as the side that was facing the Earth, it was just that its orbit around the Earth equaled its rotation, resulting in a 28-day “Lunar day”, and the Earth could never see the “dark side of the moon” leading to all kinds of myths until the Apollo Astronauts orbited the moon in preparation for landing, and saw the dark side for the first time. Since the solar energy satellites were outside the shadow of the moon, they received and transmitted solar energy to the surface 24/7. The inhabitants of Alpha Prime were Vegetarians, not by choice, but because it was terribly inefficient to raise 100 acres of grain to feed to cattle just to have a steak. Since couples were producing offspring, and people were living longer, the colony was continually growing at a 5% rate, which meant that the construction crews were constantly busy expanding the pressure domes. Travel between domes was via lighted and pressurized tunnels and airlocks. Travel on the surface was strictly limited to save wear and tear on their spacesuits. Every pressure dome had several emergency shelters with food, water, and air, and enough emergency suits to evacuate the shelter when help arrived if atmospheric pressure hadn’t been restored outside the shelter. Originally there were no pets on Alpha Prime, but some lab rats got loose, and they decided the best way to control the pests was to import cats to chase the mice. The cats bred, and soon there were dozens of cats roaming the pressure domes. The dog lovers protested, and the Council decided they had enough food and water now to allow small dogs as pets. What they didn’t count on was the micro-gravity allowed the animals to live 20-30 years without apparently aging. Several old terriers were more than 30 years old when they finally died.

Commander Rick Nelson was an Astronaut, and one of the first colonists of Alpha One. He vividly remembered the risky days spent living in an aluminized pressure shelter while they built the first underground pressure domes. Their Lunar Orbiter was one of the few of the brand-new Luna class orbiters to actually land on the moon. They were similar to the old Challenger Shuttle, but 10 times the size and they were launched using a Maglev rail system. The system consisted of two huge solid main booster rockets attached to a Maglev sled running on 30 miles of track in the Nevada desert that ran into and turned up a 10,000 foot mountain, which changed the supersonic ground speed into upward velocity. At the end of the track, the orbiter separated from the rocket-powered sled, and the four massive ramjets took over, boosting the package to the altitude limits of the ramjets, and accelerating it closer to escape velocity. Once the ramjet system reached its maximum altitude of around 100 thousand feet, and near-escape velocity, the orbiter detached from the ramjet booster package, which floated back to the earth for recovery and reuse. The orbiter’s main engines were briefly ignited, propelling the orbiter outside the atmosphere, and achieving escape velocity. Several days later, it established a stable orbit above the lunar surface. After Luna 5, they developed a cargo orbiting/landing system, and the cargo was jettisoned, and fell in a preprogrammed orbit, touching down on the surface near Lunar Colony Alpha Prime. Any packages or personnel wishing to return to the Earth were packaged aboard a small orbiter with a low-thrust rocket, and returned to the orbiter, which returned to the Earth.

Lieutenant Commander Nelson, Commander Nelson's wife, or Sally to her friends, was the first woman on the moon. They realized it was probably a 1-way trip to the moon, so NASA selected the youngest, healthiest, most compatible astronaut couple to command the first mission of the new Luna class of Space Shuttles. The Luna 1 carried a team of 10, and a cargo package about 10 times the heaviest and bulkiest load ever lifted by a Challenger Shuttle. Due to the Maglev launching system, the new Luna shuttles were only limited by the physics of large hypersonic objects. The engineers had to design Luna 1 to a mathematical ratio of mass vs. length vs. girth. Basically the Luna 1 had the same ratio of length/girth/mass as the bullet fired from a BMG-50, but several million times bigger.

After a rocky start, they figured out how to build permanent caverns deep in the lunar bedrock that would hold up to two atmospheres of pressure. Every pressure dome was pressure tested before it was occupied, and contained several pressure monitors and alarms. Any significant loss of pressure would sound earsplitting klaxons, and the occupants of the dome would rush to the nearest emergency shelter until the all-clear was sounded. Several minor moon-quakes resulted in cracks that were quickly sealed until they figured out how to dig and seal the tunnels using a boring machine with lasers that fused the silica rich soil several feet thick, and created a superior dome structure. Before then they made gunite-like substance and sprayed it on the walls, which resulted in a sealant surface maybe 1 inch thick at the most. Not only that, but making the gunite-like product used a lot of valuable water that they couldn't recover.

One of the first children born at Alpha Prime was Rick and Sally's son Jr. The medical people were freaking out when they found out Sally was pregnant, but Rick told them to stuff it, since this was supposed to be a permanent colony, and that meant that they had to risk having kids or the colony would die out. Jr. was a perfectly healthy baby, but weak by Earth Standards. Rick, Sally, and the rest of their crew were some of the strongest people at Alpha Prime, but their muscles were starting to atrophy as well. The doctors were amazed at how well humans tolerated long-term low gravity. Seems the naysayers were wrong, and the human body adapted just fine, as long as there was gravity to orient the systems. Their pulses slowed, and the blood pressure dropped since they didn't have to pump the blood back up to the heart in a gravity that was 6 times higher than the Moon. As the population grew older, they were amazed at the lack of arthritis, and other joint diseases.

Rick was sitting at their breakfast nook enjoying a rare cup of coffee. For some reason coffee beans wouldn't grow on the Moon, so coffee was strictly rationed. He thought back to the launch of Luna 1. The engineers and the Medical people argued for years, and finally the President made an executive decision, and ordered the program to proceed, and for the medical people to do everything in their power to ensure the astronauts survived the acceleration of going from zero to over 600mph within 30 miles and 2 minutes. The Program Director was right; it was a better ride than the best E-ticket rides at Disneyland. Rick wondered about the origin of that cliché, since all Entertainment parks were ordered closed almost 100 years ago when the land underneath them was deemed too valuable to waste on entertainment. With the advent of Virtual Reality, they weren't really needed anyway. He remembered being strapped

into a zero-gee couch, with an oxygen mask providing positive pressure oxygen every time he inhaled. The Medical team told him exhaling would be no problem, since the gees would try to collapse his lungs, but inhaling would be an effort as long as the SRBs were burning. Rick knew that would be the longest two minutes of his life. The entire procedure, from SRB ignition to landing on the moon was programmed into the ship's massive computer system. It had to be massive since it was designed to be removed and connected to the network running Alpha Prime. The mass storage units contained the knowledge base of the Earth. The storage units were triple-redundant and fully mirrored and fault-isolated, meaning a fault couldn't migrate from one drive to the other. Rick saw the vid of the first computers in the 1980s. He laughed when he realized he had more computing power in his wristwatch than the 2004 Pentium 4. With the advent of bubble memories, Artificial Intelligence quickly became a reality, and computing power gained at a geometric progression again. He was amazed that the drives that stored the total knowledge base of the Earth were no bigger than a shoe box.

Once Rick and Sally were strapped in, the rest of the team made the way to their suspension cocoons, where they'd spend the rest of the flight in medically induced comas to avoid stressing their bodies unnecessarily. The crew was five couples, all engineers who were trained to work on the lunar surface, and operate the equipment they needed to build permanent pressure domes under the lunar soil. Once they were sealed in, and injected with a tranquilizer, the medical support system took over, and regulated their vital systems. When all 10 engineers' were in the green, the President himself transmitted the launch code, and Rick got a huge kick in the backside as two huge SRBs lit, and millions of pounds of thrust suddenly propelled the rocket sled forward at a speed that had to be seen to be believed. Rick never imagined a machine that massive could accelerate that quickly, but two minutes later, they had jettisoned the rocket sled, which floated back to earth on parachutes, and were climbing borne on the thrust of four huge ramjet engines that gulped fuel at a prodigious rate. As they reached the upper atmosphere, pumps injected an oxidizer into the mix to maintain their acceleration. Finally the ramjets ran out of fuel, and explosive bolts separated the shuttle/orbiter from the ramjet system, which also floated back to Earth. Once the ramjet was clear, the main engines ignited for a brief period until they had reached escape velocity, and their programmed lunar transit velocity, then they shut down. For the next couple of days, Rick and Sally got to enjoy zero-gee, and took advantage of the fact that they were the first married couple in zero gee to try their own experiments while they had total privacy.

Several days later, the computer beeped, and announced it was going to roll the craft and prepare for insertion burn. After the last couple of days, Sally thought the vaguely sexual term was hysterically funny. They got strapped back in their command chairs just in time, and the craft rotated so their main engines were pointed the way they were going, and fired right on time while the computer monitored the entire process. When the engines stopped, the computer announced that they were within 1/10 of 1% of the ideal vector profile for lunar insertion. Sally giggled again, thinking about some future Lunar Insertions. She got her mind back on business, and they verified everything was set up to land on the moon, and checked on their passengers, who were sleeping soundly. As they approached the moon, they were trapped by the lunar

gravity, and started the slow spiral prior to landing. They were in no hurry, so they didn't have to use the landing technique of the Apollo program and burn up a ton of fuel. When they finally got close to touchdown, the computer controlled the burn of all their attitude rockets, and several unused descent rockets, and they touched down on the lunar surface light as a feather. They could never do this maneuver on Earth, but with the much weaker gravity of the moon, it worked perfectly. Rick reached over and shut off the master control switch, which disabled any system associated with a rocket, but left power to the computer and all essential circuits. First thing they did was make sure their crew survived the trip, and then they adjourned to the privacy of their cabin, since it would take several hours to wake them up.

Chapter 2

The next years were spent building the pressure domes, installing the garden, and other mission-critical projects. Commander Nelson was glad to be able to move full time into the pressure domes when the instruments told them that the pressure had stabilized at near-Earth pressures. With the move into the domes, the speed of improvements increased drastically since they didn't have to live in space suits. Once they had sufficient space and infrastructure, they started building the Big Ear, and then as the engineers and scientists arrived, they shipped the materials for the huge electro-optical telescope they dubbed Cyclops. Even with the rotation and slight movements of the Moon, images taken off the huge telescope were several generations better than the Hubble images. The 1-mile mirror had such resolving power that someone could be playing poker on an asteroid, and the astronomer could tell what cards he was holding! This allowed them to take detailed images from the edges of the known Universe and beyond. At the same time, they inserted a constellation of dozens of power-transmitting satellites into the Lunar L4 and L5 Lagrange Points outside the shadow of the moon where they'd always be in direct sunlight. They had twice as many satellites in orbit as they would need for the next 100 years at their best estimated growth rate to ensure they would always have power. They also had an emergency nuclear-powered generator that could replace the output of 2/3 of the satellites, but the downside of running it was it wasn't shielded, and once started; it would have to run until it ran out of fuel, or until they could safely remotely shut it down. Another backup was a WAG from a NASA scientist, and consisted of a huge Mylar solar sail configured like a gigantic kite, and tethered to the bedrock of the moon. It would hopefully provide power that would be transmitted back down the tether, and would reflect sunlight to the surface, where solar collectors would collect and transmit the light to where the plants were underground to keep them growing.

Early on, the colonists decided to maintain a Terrestrial calendar and time system. They used GMT or Zulu time as their official time zone, and cycled the light levels in the garden and the pressure domes to maintain a normal 24-hour diurnal cycle. This was easy to accomplish, since 100% of the sunlight was brought in via fiber-optic light pipes, and could be controlled by means of a shutter assembly. During the 14-day dark phase, they used electricity to produce artificial daylight. Everything they weren't using immediately was stored in secure storage deep underground. As they started producing valuable minerals and materials, Earth shipped them more and more stuff, and they just kept building storage facilities for materials and supplies they couldn't grow or manufacture on the Moon. One of the most appreciated shipments included tons of coffee and tea, since the caffeine addicts were going through withdrawal. By now no one smoked or drank, so cigarettes and alcohol weren't an issue. Since they didn't raise cattle, any milk was au naturelle and directly from Mom, so tea and coffee drinkers learned to do without milk or creamer.

The underground environment was set at a constant temperature of 70 degrees Fahrenheit, and they grew food year-round, so there were no seasons. Life underground might have been boring

except they knew that the outside environment would kill you in a matter of seconds without a suit. The last 2 airlocks between the pressure domes and the Lunar Surface required a special card and retinal scan to open to prevent unauthorized access, and prevent a suicidal maniac from opening both locks, and killing everyone in the complex.

They had a huge library of every movie, book, and song ever commercially produced on Earth. One night they were watching Mel Brooks "Blazing Saddles" in the community room, when Cleavon Little was introduced as the Sheriff and the famous line was said, everyone turned to look at Tyrone Jackson, their black head of Security, then they all laughed themselves silly. The next day someone had fabricated an old-style Sheriff's badge and presented it to Tyrone. He wore it until he retired 40 years later. He heard "Evenin' Sheriff" on a daily basis. He wished he could have a revolver and a Stetson to go with it!

Once the colony was well-established, NASA started using the Moon as a jumping-off point for missions to Mars and the Asteroid Belt. Mars was a total bust, and would have to wait for better terra-forming technology. The asteroid belts had replaced mining the Earth for needed metals, since they were present in abundant quantities, and in very high purity. Several corporations built low-energy plasma-drive mining vehicles that never got closer to the Earth than the moon, since they couldn't stand the Earth's greater gravity. The mining tugs would travel to the asteroid belt, locate suitable nickel-iron asteroids, and tow them back to the moon for processing. The pure metal would be shipped back to Earth as return cargo on the Luna shuttles. The debris from the asteroids would be used in construction, or dumped into a handy crater. The lunar colony made a ton of credits processing ore for the mining companies, and manufacturing hydrogen fuel for their plasma drives. They were glad that they were making so much money, because it cost a fortune to ship essential supplies to the moon from the earth. For all intents and purposes, the Moon Colony was an independent country, even though it was established by a joint venture of NASA and ESA. Their balance of trade with the United States was usually positive, since they sent more manufactured products and minerals to the Earth than what the US sold them in supplies each year.

As the colony grew, they elected a Council to govern the colony, and their decisions were final. Once a Councilman was elected, they could only be removed for cause by impeachment, or voluntary retirement, since they served as a Judiciary as well as an Executive branch. 6 Councilmen were elected, and the bylaws of the colony stated that any councilman had to be elected by 80% of the adult members of the colony. Any nominee not earning 80% of the votes was not selected. There were 10 nominees including Rick and Sally Nelson, Sheriff Jackson, and several engineers. There was almost no crime, because except for petty crimes, the penalties got pretty stiff since some of the smallest mistakes could get you killed living on the moon. Rick could remember an incident that cost the lives of several people, caused by an operator sleeping on duty. A mining tug was coming in to land, and he neglected to close the hangar door and seal it against the caustic gases generated by the plasma drive when it contacted the lunar surface. Later when the doors were closed and sealed and the hangar pressurized, several mechanics died a horrible death from breathing the caustic fumes. The

council had a tough decision to make, but ruled that the operator had to forfeit his life to prevent other operator's carelessness from killing more people, and he was explosively decompressed by locking the inner airlock, and opening the outer lock without depressurizing the inner one. While it was messy, it was the most humane way to kill someone they knew since death was fairly quick. Fortunately the remains were usually sucked into the vacuum of space, which made the clean-up much easier.

They built crawlers to navigate the lunar terrain, when it was impossible to travel via tunnel, like the round-trip from the Research Center to Alpha Prime since the RC was on the opposite side of the moon. The crawlers used hydrogen/oxygen fuel cells to drive electric motors, and when they refilled the hydrogen tank, they pumped out the pure water generated and stored it. They had 2 variants of the crawler: A 10-passenger crawler bus, and a tractor-trailer combination that could pull up to 10 trailers behind it, but went no faster than 10 miles per hour. The crawler bus was a transport vehicle as well as a research vehicle, and could pull several trailers as well, but at a reduced speed. Safe routes were marked by flashing LEDs on 6-foot poles driven into the ground. They had a Solar panel and a battery every so often to keep them lit during the long lunar night.

Once they had enough children in the Colony that were school age, they opened a classroom for basic instruction. When they reached 14 years old, they decided who they wanted to apprentice for, and continued their education, but it was a combination of study and on-the-job training. By their 18th birthday, most Astronomy apprentices knew more about their chosen field than the average College graduate, and several had the equivalent of a PhD level education. At the same time, most of the students elected to apprentice to various technicians. There wasn't anything wrong with it, since each student had the opportunity to do anything they liked as long as they had the ability to do the job, since their acceptance was up to the mentor they were training under. They had manufacturing plants that always needed help, and craftsman that needed help, including machinists, welders, pipefitters, electricians, and computer specialists, so no one was left out. Once they reached their 18th birthday, they were officially a Citizen of the Colony, with all the rights and privileges. Most people married young, and married for life. Adultery was considered a capital crime in the Colony since they lived in a closed society with minimal privacy. No one had private toilets or showers, since they were located close to the garden to minimize water losses, and they routinely saw each other in various stages of undress since it was common to wear a bathrobe back and forth to the showers and nothing else. Pre-marital sex was discouraged for the same reasons. As a result, they tended to marry early and not stray.

Everyone on Earth thought that WWII would be like WWI - "The War to end all Wars." Unfortunately, Man never learned from his mistakes, and 100 years after the last war, some Madman in the Middle East released a weaponized strain of Ebola that was so potent that it had a 100% fatality rate, and was airborne. When the US and Russia realized what had happened, they launched all their missiles at the Middle East, and finished the job. Later estimates were that less than 1% of the population survived the Plague and the nuclear exchange that followed, and they were reduced to savage bands of hunter-gatherers just to survive. Alpha Prime had

minimal warning, and was caught off guard when Civilization as we knew it ceased to exist on Earth. The last shuttle crew to leave Earth asked for Asylum on Alpha Prime, which was granted since the Council couldn't ethically send 10 people to their deaths since they had nothing to go back to. All the automated recovery gear was damaged in the nuclear exchange, and their navigational aids were severely damaged as well so they couldn't safely land back on Earth. For all intents and purposes, Alpha Prime was permanently cut off from Earth.

Chapter 3

A year later, Rick woke to the sound of the Emergency Klaxon “Condition Yellow, all outside personnel to shelters or vehicles. Solar flare detected, impact in 8 hours.” He checked the monitor, and was glad that there was only 1 research team on the surface, and they were close to their crawler, which would provide ample protection from the larger-than normal X-ray burst headed their way. They had designed the Colony with the knowledge that solar flares and Coronal Mass Ejections occurred fairly frequently, and buried the colony several hundred feet underground, and built all the crawlers to serve as temporary shelters for up to 20-times normal X-ray bursts. Since the burst was short-lived, any further protection was unnecessary. Their Satellites were designed to auto-furl in 8 hours to protect the huge solar panels and electronics from the effects of a Coronal Mass Ejection. The bodies of the satellites were robustly built, for both EM protection, and protection against micro-meteors.

2 hours later, they got to test the EM protection of their power-generating satellites, when the Alpha Prime helioscope detected an X-20 CME which would narrowly miss the moon. The risk of the CME was the EM pulse associated with the plasma ejection. Since they were approximately 93 million miles away from the sun, it would take 93 hours for the CME to reach them, so they had 80-85 hours before they had to furl the satellites, and switch to lunar power. Since they had hydrogen to burn, they had several hydrogen fuel cells that could back up the solar panels at reduced power output. Rick was glad that Alpha Prime was on the sunny side of its rotation, so the Garden could use natural sunlight, and they could cut back power for 10 hours. He checked his terminal, and the computer showed that the CME would arrive during the night shift, so the power loss wouldn't be a major problem. Rick instructed the computer to engage the hydrogen fuel cell backups in 70 hours, and order all the solar satellites to furl within 72 hours, leaving a 3-hour Murphy Zone just in case. Both the flare and the CME turned out to be a non-event since they had ample warning. 4 days later, everything was back to normal.

The last shuttle that landed over a year ago brought some interesting supplies, including some bio-engineered Hemp seeds that produced huge quantities of useful fibers, grew like weeds, and produced absolutely no THC. Since there were no pot-heads on the base anyway, Rick thought that the no-THC factor was overkill. The hemp fibers could be used to produce textiles, fabrics, ropes, plastics, oil, food additives, and matrix for rigid panels. He got their engineers going on digging another pressure dome just to raise a huge crop of hemp. They walked out to the hangar/garage, and climbed aboard the latest and greatest Tunnel Boring Machine, which had a 30-foot rotor, and a multi-giga-watt laser powered by massive Hydrogen fuel cells. Even in the rockiest lunar soil, it would only take a couple of weeks to dig a tunnel, excavate a huge pressure dome 200 feet high and 5 miles wide, and fuse the rock, forming a glass-like matrix 3 feet thick that was moon-quake proof, and could withstand 3 atmospheres of positive pressure without leaking. Once they had the tunnels and dome bored, they installed airlocks, and pressurized the dome to 2 atmospheres, and left it for 2 weeks to make sure it would hold

pressure. While they were excavating the dome, they bored several pipelines to the surface, and installed a huge fiber-optic light pipe to transmit light, then sealed it air-tight. Once it passed the pressure test, farmers came in and prepared the soil to grow hemp, then planted the entire dome in hemp, then installed a water and air recycling and fertilizing system which injected bio-sludge fertilizer into the water stream, and recycled excess moisture from the atmosphere, re-injecting it into the soil. The system maintained a delicate balance of airborne and soil humidity for optimum production of hemp fibers. All parts of the plant that weren't used for the fibers were returned to the bio-sludge processing facility for recycling. All the water produced by the hydrogen fuel cells powering the tractors and combines was stored in the farm's water tanks, and the excess oxygen was collected and exchanged for excess CO2 using the same system.

Several weeks later, Rick got a call from the operator in the comms shack to get over there ASAP. He ran down the tunnel, opened the cipher lock, and read the message the operator handed him

The operator said the original was in Morse code, and was very weak. The sender's call sign was KE7AZD which meant he might have been transmitting somewhere in Region 7 of the USA. He was using a fairly powerful transmitter and a directional antenna for them to be able to read his transmissions.

Rick read "KE7AZD calling Lunar Base. Using Ham radio to attempt contact. Please respond."

The operator said the message kept repeating for an hour, then nothing. Rick swore, this was a decision the council should make. He picked up the telephone, punched in a 4-digit sequence, and rang the Council chambers. "Emergency meeting in 10 minutes, council chambers, pass the word." He hung up, and jogged to the Council Chambers. 10 minutes later, all 6 Council members were seated, and looking distraught. Finally Sheriff Jackson broke the tension. "Rick, what the hell's going on - why'd you call an emergency meeting. I checked the computer, and the status is all green."

Rick slid the message form across the desk "We received this over an hour ago. I think this is something the Council should decide, but it is urgent since we don't know how much longer we can make contact with this operator on Earth."

Half the members wanted to do nothing, but Tyrone recommended they make contact, saying that they could be a source of information about what was happening on Earth. Besides, talking to 1 operator in this way wasn't a security threat, since the equipment to send a signal to the moon and back called "moon bounce" was expensive and complicated, so almost no one probably had the equipment to do it any more. Rick called for a vote, and they decided to contact the operator. Rick thanked the council, and ran back to the radio shack.

“Here, send this:

Lunar Base to KE7AZD, transmission received, acknowledge.”

The operator typed the message into his terminal, and the computer sent a burst of data back to Earth on the indicated frequency.

5 minutes later, he received “KE7AZD to Lunar Base Acknowledged.”

Rick thought “Now what?”

2 minutes later the message continued.

“LB de KE7AZD, sit crit, no food, H2O, etc. Op emg pwr, not sur ftr cntct psbl. Plg & Nk dstry civ, est. lt 1% pop rem. Tk cr. 73 de KE7AZD.”

Seconds later, the computer printed the message in the clear “Lunar Base from KE7AZD, situation critical, no food, water, etc. Operating on Emergency Power, not sure future contact possible. Plague [plg?] and Nuke [Nk?] destroy Civilization [Civil?]. Estimated Less Than 1% population remaining. Take Care {smiley} from KE7AZD.

Rick wasn't a ham, but most of the message made sense as he read it off the operator's screen. The part that killed him was that less than 1% of the World Population survived whatever had happened. Something about a plague and a Nuclear attack. Rick took over the operator's keyboard, since he didn't need Morse to send, and typed “ACK, why contact?”

“KE7AZD wtd som 1 2 knw, yr fst con wks.”

The computer translated: “KE7AZD Wanted Someone to know, you're the first contact in weeks.”

“LB ack, can we do anything for you?”

“KE7AZD, neg, nthng lft, sv yrslvs, yr all thts lft. GB & GB. 73 de KE7AZD.”

Seconds later, the computer printed: “KE7AZD, Negative, nothing left, save yourselves, your all that's left. GOODBYE [GB?] AND GOD BLESS [GB?] {smiley} from KE7AZD.”

{Loss of signal}

Rick tried several times to regain contact, but he never got another reply. The operator told him that the earth station he was transmitting from probably rotated out of line, and he couldn't hit

the moon anymore. Rick asked when the transmissions started.

“I didn’t start picking them up until an hour before I called you.”

Rick looked at his watch. It was 1237 GMT. He told the operator to try and re-establish contact tomorrow at 1100 GMT, and send an automated message to KE7AZD until 1230 tomorrow every 10 minutes until acknowledged. If they made contact, call him ASAP.

“If I don’t make contact tomorrow, how much longer should we try?”

“Do you have any pressing duties that this would interfere with?”

“No sir, the transmission is automated, I can set it up right now, and the computer will send it starting tomorrow at 1100 GMT, and will notify me if the transmission is received. It’s using a high-band transceiver that we haven’t used since we lost contact with Earth.”

“Very well, let the automated message run for a week, then discontinue it.”

“Very well sir.”

1 week later, Rick reported that there was no further contact from the operator, and told the Council the bad news. Councilman Newman suggested they might inventory their supplies, and ration anything in short supply, that they couldn’t get more of, or make themselves. The motion was approved unanimously, and they started making plans. They had already done an inventory over a year ago when the last shuttle arrived, but a fresh physical inventory would be revealing. 2 weeks later, the Council met again.

“Gentlemen, it seems we’re running out of paper products, especially TP.”

Councilman Mason raised her hand. “Gentlemen, we’ve been growing industrial hemp for over a year, and until a few centuries ago, all paper products were made from hemp fibers. I’m sure we can come up with a solution.”

Councilman Jackson quipped “Just as long as I don’t have to wipe my butt with sandpaper!”

That comment produced a wave of hysterical laughter.

Councilman Mason promised Councilman Jackson that she’d make sure that the TP was plenty soft. The rest of the Council voted to put Councilman Mason in charge of the TP project, since her butt was on the line, so to speak. Later, she recruited several assistants to research the archives and locate all the information related to Hemp fibers, and to ignore any documents related to the illegal use of THC-containing hemp. These kids were raised with computers, and were experts at doing that sort of research, and 2 days later, handed her a chip with all the

relevant articles sorted by relevance. She inserted the chip in her personal terminal, and was amazed at how useful a plant Hemp was. She found several articles directly related to making paper from hemp fibers, and brought the information to the next council meeting. They approved opening a processing plant to process hemp fibers into paper and other needed products besides the textile plant and food processing plant they already had opened. 2 weeks later, the new pressure dome was built, and the machine shops were busy making the equipment to convert hemp fibers into paper products. The engineers decided to triple their cultivation of hemp, which meant they would need more hydrogen, water, and space, which affected several different groups.

The end result of Sheriff Jackson's tender butt was that 500 people were now spending more time manufacturing products they couldn't get anymore, and mining the raw materials from the moon and the asteroid belt. The miners had agreed to join the colony, and instead of transporting their cargos to Earth, they concentrated on minerals that the colony needed to stay alive. They hauled in all kinds of asteroids ranging from icy ones with a witches brew of water, carbon, and hydrocarbons, to metallic asteroids rich in nickel and iron. They made steel out of the iron and carbon, and designed smelters that were more oxygen efficient than the old ones they read about in books. They used electricity to heat the metal, and only injected as much oxygen as was needed. The atmosphere around the smelters was strictly controlled, and the operators wore protective suits with oxygen supplies, and a CO2 absorber. The result was a much more refined metal, and they were better able to control the properties of their steel, and were able to make many different varieties that were impossible on Earth with all the free oxygen available. The lunar surface turned out to be rich in hydrogen, and oxygen in the form of oxides, but little free water. That wasn't a problem, since they had hydrogen to burn, and combined the hydrogen and oxygen to make water in huge fuel cells that also made power for their machines. Since the colony had been inhabited for almost 20 years before the collapse, they had huge stockpiles of some essential supplies like the membranes to make additional fuel cells, and other components. The mining trucks were automated, and followed a fixed route. They were assembled in long trains with a power tractor every 10 cars, and even though they only traveled at 10 mph, they could travel 24 hours per day, and their fuel cells produced prodigious amounts of pure water.

The crawler/bus vehicles were also powered by huge hydrogen fuel cells, and were over 100 feet long, and 40 feet tall, and were more than big enough for a 10-man crew to live and work in for weeks at a time, and were used as mobile research labs. They were equipped with 2 dozen 6-ft tall low-pressure high volume balloon tires with an electric motor in each wheel. They had hydrazine rockets to propel themselves across short chasms, and negotiate short impassable stretches of the moon. With the low gravity, it didn't take much to fly over small objects, and they rarely got more than 50 feet above the surface. There was always several roving the lunar landscape at any time, exploring the surface, conducting detailed sonar and radar studies of the strata below, hoping to find valuable minerals, or ET as someone had joked. Rick guessed too many people had seen Stanley Kubrick's "2001 a Space Odyssey," or was it Spielberg's "ET"? Anyway, the scientists on the Colony were an odd lot, and collected Gary Larson's "Far Side"

cartoons and memorabilia even though Gary Larsen had been dead for almost 100 years. Gary was born in Tacoma Washington, in 1950, and first wrote “Nature’s Way” for the Seattle Times. His zaniness attracted a cult following in scientific circles, and several of the Research Center Astronomers decided to pack their Far Side mugs as their one prized personal possession in their very limited luggage allotment.

One of the discoveries from the mobile research labs started the asteroid mining project. They found huge sources of previously unknown minerals on the moon, including rare metals in sufficient quantities to make them a “cash crop” for the lunar colony. Since they were no longer shipping them to earth, they found, smelted, and stockpiled the metal in pressure domes for later use. This stockpile of metals would later save their lives, or at least make it easier for them to build stuff when they needed it, instead of having to wait for them to mine and process the ore. The steel was shaped and cast into useful shapes including beams, pipes, wire, and tubing. They found all the raw materials for making a huge quantity of titanium, aluminum, and other exotic metals, and stockpiled as much as they could make for later use.

Once they were going full-bore growing and processing hemp fibers for everything under the sun, the wondered what else they could grow, produce, or mine that they would need now or later. One of the scientists suggested that they would run out of acrylic and other plastics, so they needed to start investigating substitutes. The council appointed the scientist the chairman of the committee to investigate replacement products. On Alpha Prime, if you suggested something needed to get done or researched, you often got stuck doing it if you were qualified. That cut down on people making ridiculous requests to the council, and wasting their time, since all the councilors held full time jobs besides being councilmen. The scientist started his research, and discovered that several asteroids that the asteroid miners had towed in were rich in hydrocarbons, and invested the help of his friend the Chemist to analyze and evaluate the asteroids. It involved spending weeks in space suits, but when they were finished, the Chemist told him that it was worth it. The asteroids had been parked on the lunar surface as useless years ago, since they had plenty of plastics. Several hydrocarbons he identified were the raw materials of modern plastics, and the asteroid weighed thousands of tons. The Chemist and the other scientist met the Council and discussed their ideas. The council agreed it would be worth building another pressure dome, and the equipment necessary to process the raw hydrocarbons into usable products, including plastics.

Chapter 4

Several months later, one of the stores managers reported to the Council that huge rats were eating and destroying the grain storage, and the cats were afraid of them, since they were as big as the cats. Sheriff Jackson suggested exterminating the rats, and the debate raged on for days, trying to find a humane and Politically Correct solution to the problem. Part of the problem was that Sheriff Jackson suggested shooting the rats, since a trap big enough to catch and hold these huge rats could easily kill a cat or small dog as well. All projectile weapons had been banned by the UN Global Disarmament Convention of 2030, after WWII, when the Global Disarmament movement finally overran the United States, the last holdout. By then all the Conservative Americans who believed in the original intent of the Constitution were either dead, in State Custody, or in a Retirement Home. In 2020, Congress passed Patriot Act X, which made seditious language a felony, and resulted in a massive roundup of almost half of the American Population using lists, paid snitches, and profiling. They were incarcerated for Rehabilitation, as the Government called it, but very few people were later released. The Supreme Court ruled that protesting the arrests was also considered Sedition, and the protests stopped.

Finally after a week of debates, Sheriff Jackson took the bull by the horns, and pulled rank. “The Council has put me in charge of Colony Security, and this is security matter, since the rats are a direct threat to our security. If they continue to breed and eat our stored grain, we’ll starve, and it will destroy the colony. Therefore, I’m going to take care of this matter as I see fit, and have the machinists build some pellet rifles suitable for rat killing. Those of you who oppose killing animals on ethical grounds will just have to get over it - besides you won’t be asked to participate anyway!”

The Chairman of the council was glad that Sheriff Jackson had handled this dilemma like he did, or the Council would have debated it to death. The Sheriff met with several machinists, and searched the database looking for suitable weapons. The located information on Pellet Rifles and Paintball guns under weapons, and decided that an air-powered pellet rifle would be perfect. They copied elements of the Paintball gun, and blended elements of the pellet rifle to make a really ingenious weapon. It fired a 10mm 3 gram frangible Aluminum bullet that contained a droplet of a temperature-resistant liquid in the core, so the bullet would self-destruct shortly after hitting something solid, which would be perfect for use inside the domes, since they didn’t want a round that could penetrate the shell of the dome, or the airlocks.

They took their design to the Research Center, and they suggested several improvements, including an AR-15 style safety selector, that instead of controlling how many rounds were fired each time the trigger was pulled, selected the velocity that the bullet was fired at. Once they built several prototypes, they tested them at the research center to calibrate the switch. They came up with 3 settings. The lowest power setting propelled the bullet at 100 meters per second, which was capable of killing a rat out to 10 meters. The Medium power setting

produced a 200m/s velocity, and the High power setting produced a 600m/s velocity, which gave the rifle a 200 meter range. Sheriff Jackson asked that any rifles issued to someone besides himself and his Deputy be limited to 100 meters per second. The machinists assured the Sheriff that they could pin the receiver so the switch had a 4 positions available (Safe, 100, 200, and 600m/s) but would be limited to the slowest speed unless you removed the pin.

Sheriff Jackson liked that idea, because he had a gut feeling they might need the higher settings some day. He told the machinists to make a dozen rifles, 12,000 rounds of ammunition, and pin all but 2 of them so they could only operate on the lowest setting. While they were at it, the Machinists requested that the Optics Lab at the Research Center build a dozen laser sights, super high power flashlights, holosights, and telescopic sights that would mount to the full-length rail on the weapon. The magazine for the weapon was mounted under the barrel, and contained 20 rounds in a pressurized tube. The rifle was a semiauto gas operated action, which tapped the high-pressure gas off the barrel after the round had passed, then pushed a piston connected to the slide, which forced the slide back against spring pressure just far enough to allow a single round to escape the magazine under air pressure, and be driven forward into the chamber by spring pressure. The trigger's only function was to open and close the valve that allowed high-pressure air into the chamber, driving the bullet down the barrel. The Compressed Air Reservoir was a 1-liter high-strength aluminum tank that they used for small painting jobs and other tasks, and the back of the receiver was threaded to mate to the air tank, and a plastic buttstock was slipped onto the base of the tank to provide a firm shoulder mount.

Two weeks later, the Optics lab had the lenses ready, and they worked with the Machinists to build the various sights. The laser used a high-frequency pulse to reduce the drain on the battery, and make the laser dot easier to spot in bright light. The flashlight was cutting edge, and produced several million candle power out of a bulb and lens assembly the size of a small pack of chewing gum. The rechargeable battery that powered both lights was buried in the polymer forend with the laser and flashlight, and could power the laser for 50 hours and the flashlight for 20 hours between recharges. They were both controlled by a set of momentary touch pads installed in the forend. The laser was boresighted to the barrel, and its point of aim was adjusted by the selector to match the point of impact of the bullet at that velocity. The flashlight head was threaded so a half-twist of the head changed the focus from a spot to a wide flood. The Holosight could be used with or without the laser, out to 100 meters, and the telescopic 3-20 power scope was designed to engage targets day or night out to 200 meters.

Once the rifle was completed Sheriff Jackson and his deputy checked the weapons out thoroughly, and they had minimal recoil, and were as accurate as a laser rifle. At 100 meters per second, the bullet penetrated a soft target the scientists said would replicate a small animal and disintegrated before it came out the other side. When they cut it open, the target looked like a grenade had gone off inside, so they knew it would kill rats. They took their weapons out to the granary, and spent the next couple of days shooting rats. Soon some of the older kids were asking to join in, and the Sheriff said they needed their parent's written permission, or they needed to speak directly to him. Sheriff Jackson realized that shooting rats was challenging and

fun, and soon had 6 volunteers working with them, and they quickly cleaned out the rat population. The rat bodies were added to the bio-sludge recycling system which disposed of the bodies without creating any odors. They checked the granaries once a month and usually only found a couple of rats, and virtually no rat pellets compared to before.

Once the rats were cleared out, the stores manager was re-arranging things when he found a huge jute bag full of Soybeans, and several dead rats nearby. Puzzled, he examined one of the soybeans, and it didn't look like a regular soybean, so he bagged a handful, and took it to the farm manager, who said that he had treated seed soybeans, and they belonged with the seeds. They went back to the stores area, and the farm manager shook his head. There were 5 100-pound bags of soybean seed stacked up in the back. "Good thing no one tried to eat these, or they might have gotten really sick!" He loaded them on his cart and hauled them back to the farm's storage bin. He did some research on the computer, and realized why someone packed 500 pounds of soybean seed. He took his information to the Council, and they unanimously authorized a hurry-up program to plant all the soybean seeds, since the rats had eaten or spoiled almost 1/4 of their stored grain, and they were getting short on protein sources. Several weeks later, they had the pressure dome constructed, and were ready for planting. The tractors were driven over to the new "fields" and the soybeans were planted.

2 square miles of lunar dirt, supplemented with their bio-fertilizer yielded almost 45 bushels per acre, since the environment was so well controlled, and the moisture and temperature could be kept at optimum levels. The farm manager was grateful that their fields were so productive, and free of the normal pests that could wipe out entire crops. Later that year, the combines harvested the beans, which were dried, sorted, and bagged for later use. They built a small processing plant to convert some of the beans into meal and oil, since they didn't have a good source of vegetable oil except the hemp production, and almost all of that oil was being used to manufacture plastics. The meal was further processed into TVP and mixed with spices to give a fairly tasty meat substitute, which greatly improved the variety in their diet. The TVP was such a big hit that the Council requested that the rest of the beans that weren't going to be used for seed be converted to TVP, and to max out their Soybean production facility.

Things were moving along very well for Alpha Prime, and Sheriff Jackson was worried. When things were too quiet, he was sure something bad was going to happen. It started with a rash of domestic squabbles, and before they knew what was going on, several people were incarcerated. The Council was at a loss until someone pointed out that the population had grown from 500 colonists to closer to 1500 colonists in the last 20 years, and they were set to gain another 3,000 if every couple had 4 kids. Population control was 1 discussed alternative, but Rick quickly vetoed that idea. He suggested building enough colonies scattered all over the moon to make each colony between 500 and 1,000 people, that way if anything happened, and a colony was wiped out, her sister colonies might survive. The moon was over 8000 miles in circumference, and held numerous locations that would be ideal to establish new colonies. They checked, and between their hydrogen fuel cells and solar satellites, they could build a new colony every 20 years, and slowly populate the moon. Rick secretly hoped one day that the colonists would

repopulate the Earth, but the probability of that with their existing medical technology was so low to be a waste of time for now. Besides, if they ran out of room on the Moon, Jupiter had dozens of moons, and several of them were habitable.

With that settled, the Council decided on a 5-year plan to build a new colony about 2,000 kilometers away, which was just far enough according to the scientists that if a meteor struck the moon, and wiped out Alpha Prime, Alpha Beta might survive. They started setting aside seeds, and building all the essential equipment they would need at a new base. Construction at Alpha prime was halted, except for essential projects, and the TMBs and the rest of the construction equipment was hauled to the new location the Mare Australe in the lunar southern hemisphere. The Mare was a 600 kilometer wide plane that was geologically stable. The site was just about 2,000 kilometers from Alpha Prime, and had several tall lunar ranges between the sites, which was a prime requirement from the scientists for preventing 1 incident from taking out both colonies. The managers of each department set aside equipment and stores for shipment to the new colony as soon as the construction crews had the pressure domes built. Rick remembered the last time they built a colony from the ground up, and was glad they had a permanent base to work from this time, and the construction crews could sleep in their crawlers until the pressure domes were completed. The Council decided to duplicate the design and setup of Alpha Prime and distribute a duplicate set of equipment to Alpha Beta. They'd set up a digital radio relay station on one of the lunar mountains between the two bases that had line of sight to both bases, so they could stay in constant communication, since they didn't have a duplicate set of helioscopes for Alpha Beta. They really didn't need one, since the sun was in constant view between the Research Center on the Dark Side, and Alpha Prime on the Terrestrial side of the moon.

Over the next 5 years, they dug the tunnels, pressure domes, installed the air locks, transported or manufactured new equipment for the colony out of stored materials, installed the new equipment, tested everything thoroughly, plowed the fields under the domes in preparation for planting, and basically got everything as ready as they could. The council interviewed the colonists, and determined who should stay and who should go. First they asked for volunteers, and they got 2/3 of the number needed right off the top. Several specialists with essential skills were told that they'd have to go too. The Council was as understanding and fair as it could be, but in the end, some people volunteered, and others were ordered, so they'd have all the essential skills necessary to run an independent colony in case something happened to Alpha Prime. One of the first things installed was a duplicate of their computer system. Since they were manufacturing most of the components for sales to Earth, they had a huge stockpile of components, then it was just a matter of copying the data to the new memory modules. While they were at it, they built 2 additional sets, copied the data onto them, and stored them in a very secure place. Each colony got 1 back-up set. Finally the day arrived for the formal opening of Lunar Colony Alpha Beta. All the colonists who were relocating were driven over, along with their stuff, and the Council came along to give speeches. The Council mercifully kept the speeches short, cut a ribbon to signify the opening of the new colony, and now the Moon had 2 colonies: Alpha Prime, and Alpha Beta. The start-up of Alpha Beta, or Beta as everyone called

it, went even more smoothly than the start-up of Alpha because they had so much extra experience and expertise in building domes over the last 25 years. Commander Rick Nelson's son Junior was in charge of the new colony, since they were too new to have a council. He married his girlfriend Europa on her 18th birthday, and they immediately started having kids. He realized why his Dad came home tired so many nights after a very exhausting week working what little bugs remained out. Finally things settled down to a nice safe boring monotony. Over the years Beta continued to grow, as did Alpha, and 20 years later, Gamma Colony was built on Mare Frigoris in the northern area of the Terrestrial side of the moon. By now there were almost 10,000 people living on the moon, and couples stopped having large families by themselves, and usually limited themselves to 2 or 3 kids. 20 years after Gamma Colony, Delta Colony was built on Mare Nubium. Since Alpha was on Mare Ibrium, the colonies had populated the major mares, or plains of the Terrestrial side of the moon. The research center had expanded during the same time, and now encompassed 3 mares on the Dark Side of the moon.

20 years after the completion of Delta, several Scientists asked for an audience with the Council at Alpha Prime. The colonists at Beta, Gamma, and Delta decided that since they were in constant communications with Alpha, it was a waste of time and energy to have their own Councils, so Alpha was elected to settle all the issues for the 4 colonies. The scientists took a crawler, and a week later, arrived at Alpha very excited. The Council met the next day, and what the Chief Scientist told them floored the Councilors.

“Ladies and Gentlemen of the Council. For the last 6 months we have been testing a prototype Fusion reactor. It's been running perfectly since we started it, but it took until 6 months ago to get the bugs worked out of the magnetic bottle. Finally we achieved a stable bottle that could produce enough temperature and pressure to sustain a fusion reaction, so we injected Hydrogen isotopes into the bottle, and the reaction started. Eventually the reactor was making so much power that we could shut off most of our fuel cells and disconnect from the grid, and still make more power than we needed. This excess power finally allowed us to try some anti-gravity experiments, and we've succeeded in building an artificial gravity machine that is capable of generating anywhere from +10 gee to -10 gee, so it could easily replicate Earth Gravity here on the moon. It can also act as a repulsor to lift heavy loads off the lunar or Earth surface. What we'd like to propose is to install an Artificial Gravity system in a new colony, and acclimate the colonists slowly to Earth Gravity, in hopes of returning to the Earth. In a generation or so, they should be fully acclimated to full Earth-normal gravity, and be able to return to Earth if we used an Ion drive with an Artificial Gravity machine. They'd be able to travel back and forth at will without needing the huge chemical rockets I read about, and the trip would only take a couple of days instead of several weeks. If we built the colony now, it would only take 20-40 years for them to acclimate and be able to return to Earth.”

The Council sat in stunned silence. They never realized this was possible. They'd talked about weight training regiments, but this was right out of left field. If this could work, it would shave decades off their estimated return date to Earth, and hopefully someone would still be left.

Chapter 5

Once they got back to the Research Center, the Scientists pulled out all the stops inventing stuff the Colonists would need to safely return to Earth. The metallurgists developed new metals, including a composite that was 10 times as strong as the Chobham Armor protecting the M -1 Abrams, but 1/8 the weight and thickness. It could be molded or cast into shapes, and was extremely heat resistant too. They compared it to the material the Luna series of space shuttles were made of, and decided to build an entirely new spacecraft from the ground up, since they weren't dependent on the Maglev system any more. They installed a brand-new computer system, an artificial gravity system that could encompass the entire ship, an Ion drive for propulsion, and hydrazine rockets for landing, attitude control, and maneuvering in the Earth Atmosphere. The new shuttle was 50 times the size of the enormous Luna 5, only needed a crew of 10, and yet had enough space for 600 colonists plus all the supplies they'd need to re-colonize the Earth, if they decided to stay.

The Scientists had studied Earth History, and decided the Colonists might need some serious firepower for self-defense. They built 4 armed hovercraft using the anti-gravity machines, and hydrazine rockets for thrust and lift. They improved Sheriff Jackson's idea, and built several guns firing the aluminum projectiles, except the main gun had a 40mm bore, and fired a 26 gram round packed full of super-high explosive with a smart detonator that could either punch into the heaviest fortifications, or air burst over troops in the open. The round used a shaped charge to penetrate armor or fortifications, or fired as a shrapnel air burst to destroy ground troops. When he saw the new designs, the Sheriff Jackson just shook his head. The only thing that had changed about Humans in the last 60 years was we were even better at killing ourselves. The other weapons ranged from 10 to 20mm, and were full-auto. The 20mm guns magazines were loaded with a mixed load of frangible, SHE, and an AP round using a core of the same exotic metal they used in their armor. All they had to do to make the weapons full auto was to connect the air input to a huge high-pressure/volume compressor, and instead of the trigger opening and closing the valve each time the trigger was pressed, the air valve stayed open as long as the trigger was held back. The guns were fed by huge magazines containing enough rounds for any eventuality. The huge compressor could provide 4 times as much air as they needed to run all 10 weapons turrets on the shuttle. The Hovercraft had a fixed forward firing 40mm cannon, and 2 turret-mounted 20mm auto-cannons for self-defense, and a large pressure tank instead of the house-sized compressor. The 40mm gun fired at 500 rounds per minute, and the 20mm cannon fired at 1,000 rounds per minute. The guns had a range of over a mile since their muzzle velocities were around 600 meters per second.

They built enough 10mm pellet rifles for everyone, and removed the pins, since they might need the higher lethal velocities if they made it to Earth, and ran into trouble. They all carried non-lethal stunners, but they were short-range weapons with a 25-meter maximum range. The scientists knew some more PC members of the Colony might not approve of the weapons, but they realized what they didn't know wouldn't hurt them. The Scientists endlessly debated how

far Civilization had fallen since the “big bang”. Some theorized that the Terrans had reverted all the way back to the caves, others to the 1800’s and villages; and others said it would be like “Mad Max” with warlords and gangs fighting over limited supplies. It was the Mad Max scenario that made them decide to build as many weapons as possible. They hoped that the weapons wouldn’t be needed, and if they were, they hoped they would be enough. When they found out how much aluminum Alpha Prime had stored, and it hadn’t been used for almost 60 years, they took all of it, and made projectiles out of it for the pellet rifles. They had a total of 8 40mm cannons, 14 20mm auto-cannons, and 2,000 10mm rifles; so they built 20 million 10mm frangible rounds, 10 million 20mm rounds, equally divided between SHE, AP, and Frangible rounds; and 10 million 40mm multi-purpose rounds. Still they had metal left over, so they stored it aboard the shuttle, with instructions on how to make more rounds, and more guns in case they needed them later.

Commander Rick Nelson remembered something he missed once they ran out of the supplies from the last shuttle, and then he realized it was Coffee. He remembered something about a new colony being built with artificial gravity so they could acclimate to Earth gravity, then he remembered that the reason they couldn’t grow coffee on the moon was the lack of Gravity. He checked his terminal, and called the Stores Manager, and sent him on what he assumed was a wild goose chase. Since Rick was a Councilor, he obliged. 2 days later, he called back. He found some cryogenically preserved green coffee beans, and the label said that it was 500 pounds of mixed beans including Jamaica Mountain Blue, Kona, and a couple of names Rick didn’t recognize. He sent a message to his son, and suggested that when the gravity in the new colony reached 50% of Earth Gravity, they should try planting a small test batch of coffee beans. Junior asked “What’s Coffee Dad?”

“It’s in the Database. For decades, Americans and other Terrans drank coffee in the morning to help wake up. It was aromatic, and contained Caffeine, a natural stimulant. We had to stop drinking Coffee and Tea when we found out that the plants wouldn’t grow in Lunar Gravity. Hopefully it will grow once the gravity equals 50% of Earth. If not, try again when it reaches 80%. If it still doesn’t work at 80%, bring the rest of them back to Earth with you, and you might get lucky.”

Junior told his Dad OK, but he was sure he was Senile. Still he checked, and he was amazed at what he found. There were pages and pages of information related to coffee, tea, and all the customs related to them. Junior decided that even if the whole thing seemed bizarre, that it was important to his Dad, so he’d do what he could.

The Scientists came across an article describing the helmets and web gear worn by US Army troops right before the Big Bang, and realized that the Colonists might need some bullet-resistant gear just in case the Terrans had built primitive projectile weapons. They copied the latest “fritz” style helmet with a Lexan face shield, and built a Load Bearing Vest and inserted thin plates of the new armor. They tested it extensively, and found that 5mm of the new armor could stop their 20mm AP round. While the armor wasn’t flexible, if they put a curved plate in

the front and back, it would give them some coverage. They added thinner pieces of armor to the shoulders and sides of the vest. They made the helmet out of the same material.

They were confused about what all the pockets were for, until they read that the average infantryman carried hundreds of rounds of ammunition in metal magazines, and high-explosive grenades. The Scientists had already built a 40mm Super-high explosive round, and were curious about how to build an anti-personnel grenade with the new explosive, and how well it would work, and how to keep it from killing the soldier that threw it along with the enemy. As they read further, they realized there were 3 different types of grenades: 40mm grenades that were launched by a propellant 100-300 meters down range, Defensive hand-thrown grenades with a large shrapnel-producing charge, with a 10-25 meter kill radius, and smaller baseball-sized offensive grenades with a 5-meter kill radius designed for in-close combat.

They realized that the propelled and small offensive grenades would be the most useful, and got working on designs. What they ended up with was an auxiliary single-shot barrel that mounted under the 10mm air rifle that connected to the same air supply as the rifle, and fired the 40mm cannon shell at a reduced velocity of 50 meters per second, and a range of 300 meters. They designed a small mini-grenade with a 5-meter kill radius that weighed 230 grams. It had a timer knob on the top that set the detonator delay to anywhere from 1-10 seconds, and a safety lever to prevent the detonator from arming. They practiced throwing dummy grenades in an unused tunnel, and could throw them the entire length of the tunnel in moon gravity, so they should be capable of being thrown maybe 100 meters by a strong man on Earth. They went through the list of basic equipment, and didn't understand the function of everything, but duplicated it as well as possible. They ran into a couple of snags when they realized the navigation satellites were probably either damaged, destroyed, or crashed since it had been so long, so they included a small cluster of mini-satellites that could interface with their navigation software. Once they fixed themselves on 3 guide stars, they could begin to triangulate their exact position, and the position of receivers on the ground.

The basic equipment was far advanced from what a US Soldier had in 2030. Their LBV contained an 8-liter water bladder with a built-in filter that delivered water that was indistinguishable from distilled water. Their first-aid kit was unrecognizable, and only contained 6 items, 1 to seal wounds, 1 antibiotic/antiviral drug, and a generic blood expander with a built-in blood vessel repairing component. 1 item that no soldier of 2030 would be familiar with was a suicide pill, in case they were mortally wounded, and about to be captured. The pill would kill them instantly, and replaced tossing people out of airlocks as the preferred method of execution on the Moon Colonies. The other 2 were so foreign that there was no word to describe them, except that the device automatically started a stopped heart, defibrillated a fibrillating heart, paced a fast or slow heartbeat, and repaired any damage to the heart. The other device could almost restore the dead when placed on the forehead. It could revive someone who was clinically dead unless they have been dead over 6 minutes. They dubbed it the Lazarus device.

The pockets of their LBV contained 50 20-round tubes containing refills for the magazine of their air rifle, 50 40mm grenades, and 10 offensive mini-grenades. Their combat knife was a strange shape that had evolved from all the major knife shapes over the centuries. The maker claimed it was the “Ultimate Knife”. What it was, was a good compromise that could do almost everything a knife was required to do, but it was a pain to sharpen, and didn’t work too well as a fighting knife. They had advanced radio gear that included all the features found in radios dating from 2030, but the size of a small paperback book, with a 10,000 mile range, and fully digital. Their wristwatches had more computing power than a 2004 Pentium 4, and were accurate to 1 second per 100 years. It contained a multi-function watch, short-range fully digital communicator, address book, calendar, appointment book with full alarm functions, navigator, camera, security device, locator, and if you got bored, it even played games. The dual-battery system was good for a lifetime, and the watch was rechargeable either by its onboard solar power chip, or by plugging it into a power supply overnight.

The Scientists had overlooked 1 important fact in their research. When Alpha Prime was first built, NASA requisitioned a million gallons of pigment for the inside roof of the pressure domes. They requisitioned a Sky Blue color, and some supply clerk must have had a huge supply of UN Blue lying around, and substituted it for the requisitioned Sky blue. The color later came to be known as Luna Blue, and its origins faded into obscurity. Where they made their mistake was by using Luna Blue as the primary color for their space ships, helmets, and clothing. Sometimes the details DO make a difference.

It took longer than the Scientists thought to acclimate the new colony to Earth Normal Gravity. They were all suffering the effects of extra gravity due to their weak bones. The Scientists realized they needed a calcium supplement, and weight training to build up their muscles and bones. The fast schedule of increasing the Gravity inside the dome was scrapped and replaced with a much slower, more gradual schedule. Unfortunately this also pushed back their plans by a generation, but they knew what they were doing. The 6-g difference between Lunar and Terran gravity was too much to try and accomplish within 1 generation, and they decided to push the project back to the second generation, so the grandchildren of the existing colonists would be the first ones to set foot on the Earth in over 100 years.

While they waited, the Scientists experimented, and came up with an idea based on the old Land Warrior program, but used modern technology. All relevant data was projected onto the visor/view screen when the visor was in the down and locked position. They added a day/night miniature camera to the helmet, and fed the data to the view screen, including compass heading, enhanced day/night imaging, location of friendly forces, and location of probable enemies based on some more sensors embedded in the helmet that could detect a heartbeat at 500 meters. By the time they were finished, someone quipped that the explorers looked more like the Imperial Storm Troopers from Star Wars. It was a good thing they wore blue instead of white, or they’d be a dead ringer for the dreaded Storm Troopers.

2 weeks later Commander Rick Nelson was called into a secret Council meeting. Most

meetings were open with the exception of disciplinary meetings, to avoid harming the innocent. When Rick was seated in his chair, the Chairman of the Council gavelled the meeting to order “Order in the Council. Sorry about the short notice, but there was no choice. Ladies and Gentlemen of the Council, we face a grave task. You all know the penalty for adultery, and it seems we might have a case of Adultery before us.”

“Mr. Chairman, we’ve only had 1 case of Adultery in the Lunar Colonies since its inception, are you sure?”

“Unfortunately Councilor Nelson, they were caught in the act on the Security Cameras; Sheriff Jackson was the one that brought it to my attention. Seems the parties in question thought if they took off their watches with their locators, they’d be safe. We never told them that if a watch was removed outside of their homes, it would sound a security alert, and turn on the security cameras to find them as quickly as possible.”

“Very Well Chairman, Proceed.”

Two couples approached the bench, followed by Sheriff Jackson and a deputy.

The Chairman addressed both couples “You know the penalty for adultery is execution. Both parties are subject to the punishment, so if you’re found guilty, both of you will be executed. How do you plead?”

Both parties said “Not Guilty Chairman.”

“Very well, Sheriff Jackson, present your evidence.”

“Last week there was a security alert prompted by 2 watch’s security alarms going off by being opened outside their homes. The security cameras in Storage Facility #1 found them and recorded the following.” The Sheriff pressed a remote, and a video screen played the tape of the 2 lovers undressing each other, talking, and finally getting down to business. After about 5 minutes, the Sheriff mercifully stopped the playback. The accused Adulteress was weeping and sobbing, and her lover looked like he knew he was about to die.

Sheriff Jackson continued. “Chairman, acting on your orders, I asked the computers to enhance and positively identify the faces in the frames. The computer came back with the names of the parties before you now.”

The Chairman addressed the Council. “As much as it grieves me to say this, we are faced with incontrovertible proof of their crimes, and no discretion as to their sentence. The only way we can save these 2 people is if their spouses choose to take them back and not press charges.”

He turned to the spouses of the adulterers. “The decision to execute them or spare their lives

rests in your hands, since you were the aggrieved parties. If you decide not to press charges, you can't later ask for a divorce based on this incident of adultery, and if this occurs again, the Council will take the decision out of your hands and execute them. Do you wish them to be executed, or do you not wish to press charges?"

The man whose wife had strayed was holding his sobbing wife. "Mr. Chairman, I love my wife, and couldn't order her execution. Therefore, I ask NOT to press charges."

"Very Well, you're free to go, but remember what I told you, if this happens again, she forfeits her life. I'm scheduling counseling sessions for the two of you starting right after this hearing adjourns."

"Thank you Mr. Chairman!"

He led his sobbing wife out of the chambers.

"Ma'am, It's your call!"

"Mr. Chairman, I don't know how to tell you this, but I've always suspected my husband of running around on me, and I don't think this is his first time. IF I decide not to press charges, I can't guarantee that he'll stop. I know it's an emotional problem and an addiction for him, but if that's the choices I have, I say we should execute him."

"You Bitch! I'll kill You right now!"

The Defendant jumped towards his ex-wife trying to kill her, but Sheriff Jackson was faster, and tagged him with a Taser. He fell to the ground writhing from the huge jolt he received.

"Obviously Ma'am, you chose correctly. Therefore, I have a motion before the council - Death for the Defendant. Your decision must be unanimous."

All six hands were raised, indicating they agreed with the motion.

"So noted. Sheriff, take the defendant to the place of execution, and then dispose of the body once he's been administered the pill."

Chapter 6

Over the next 6 months sessions of intensive therapy, the woman's story came out. Her husband drove a crawler, and was away from home a lot. Romeo had first befriended her, and then seduced her. This was the first time they had been together physically, and while he was great at seduction, he was a lousy lover. She was scared to death after the hearing, and swore to her husband that she'd never stray again. The counselor recommended that her husband's schedule be changed so he was home every night. The Council reviewed the counselor's suggestion, and decided to rearrange the schedules of the married truckers so they were home every night, leaving the single men to handle the long-haul assignments. They hoped that this would avoid any other problems with adultery. 9 months later, she was pregnant with their first child, and it seemed that she was a different woman with her husband home every night. His attitude at work improved too, and things in the Colony were soon back to normal. Romeo's wife remarried, and she was finally in a happy and secure relationship. Romeo's contribution to the bio-fertilizer enabled them to grow another whole field of soybeans.

The Scientists had been busy too, and since they felt the defensive needs of the Explorers had been met, they concentrated on Environmental issues. They realized that the Earth might be different after the thermonuclear exchange, and the soil itself might be sterile. Though that was a remote possibility, they cryogenically preserved a large sample of microbes that would be necessary for successful farming. Every year, they took 10% of the seeds and preserved them in the same way. They also introduced animal and plant recognition lessons into the curriculum in the schools, in case there were any animals left, they could easily identify them. Unless the soil was sterile, the plants should have survived, so they included intensive studies in Earth biology in the schools, and trained several apprentice researchers into the new field of Earth Biology. Realizing the Earth would need scientists too, they each took several apprentices for training in their specialty, and emphasized that they were to concentrate their studies so they'd be experts on Earth systems. The Physicists didn't have any problems, because Physics was Physics. The Astronomers were in a quandary, since Moon-based Astronomy was light-years ahead of earth-based astronomy, to the point that right before the big bang, most earth-based Astronomers either transferred to the Moon, or analyzed data taken from Big Ear or the huge Lunar Telescope. Since there was so much data to be analyzed, this worked for decades until the fateful day of destruction. The Astronomers finally realized that they were capable of taking care of deep-space research issues, and switched the Earth Astronomy students' emphasis to near-earth studies, including an asteroid watch system, and a crash program to get essential satellites back in orbit around the Earth. All the Tradesmen got into the act, and took on extra trainees, so there would be someone capable of teaching the new technology to the remaining Terrans. Some of their Lunar-based technology and techniques weren't applicable to the high-gravity, high-oxygen environment of Earth, but most of it was.

The Explorers, as the new colony was known, were slowly adapting to the higher gravity. The Scientists were alarmed at the increased rates of injuries, and a rash of broken limbs, even after the increased calcium in their diets. The most alarming information was the increased rates of

aging. It wasn't as if the people in lunar gravity were living longer, it was they just had less health problems. They realized there was a trade-off for living in higher gravity. Everyone in the colony was eager to be able to return to Earth, and at least find out what had happened. Some wanted to colonize the planet, and several wondered if the people living there would even accept them as Humans, since by the time they returned to Earth, they had been cut off from Earth for over 100 years. The main things they could offer the inhabitants of the Earth were their technology, and medical knowledge. The lunar doctors trained hundreds of trainees in medical fields. Every colonist was cross-trained to at least a First Responder level, and 30% were trained as Paramedics. 20% of the colonists were picked to be doctors of 1 type or another. Luckily there was nothing equivalent to a Lawyer on the Moon, so that wasn't a problem.

Sheriff Jackson was due to retire, and he was the only man on the Colony with any Military Experience. His title before being named Sheriff of Alpha Prime was Master Sergeant Jackson, USMC (ret.) He had saved all his Military books and manuals over the years, and had quite a collection. They were downloaded to his personal disk, and he made several copies. Rick Jr. selected 10 young men who would learn the art of Soldiering, and they would each train 50 colonists. They spent the first year or so learning everything they could out of his extensive library of Military Science books including Sun Tzu's "The Art of War" and other famous authors. Sheriff Jackson had the latest Military Training Manuals from all 4 services in his private database. Once he felt they had enough book knowledge, he took over a small pressure dome in one of the lunar-gravity domes in deference to his advanced age, since he was almost 80 years old by now. The students had adapted to almost half-normal Earth gravity, so a trip to the lunar colonies was like "walking on the moon" to them, and they had to watch their strength. Sheriff Jackson had 10 air rifles set to Lunar gravity so they could practice their marksmanship. He told them the ballistic computers in these rifles were set to Lunar Gravity, and the ones aboard the Shuttle were programmed for Earth gravity, so they'd work on Earth. They started on the 25-meter line, then drove over to the granary to see if they could bushwhack some rats. The current crop of rats were much smarter than their ancestors were, so they were harder to find, and difficult to hit. The good news was there wasn't as many of them, since they had finally whittled the rat population down to size. It took them several weeks, then their shooting skills got to the point where they could hit any rat they saw.

One of the students showed a remarkable ability to shoot rats farther away, so the Sheriff let him use his personal air rifle with a telescopic sight, and the higher settings. He started hitting more rats than the rest of them combined, since the rats knew that if a human was close enough to see them, they were dead, so they stayed farther away. Steve was hitting rats out past 100 meters, and Sheriff Jackson decided to show him his Marine Scout/Sniper documents, and learn how to shoot really long distance. He contacted the Scientists, and asked them to come up with a Sniper Rifle that could hit a man-sized target at over a kilometer.

They went to the drawing board, and came up with an ingenious rifle. The barrel was 1 meter in length and integrally suppressed, and used an explosive gas and electronic ignition, so the

trigger was a micro-switch. The rifle was equipped with a bipod/monopod, and an exotic gyro-stabilized stock that absorbed all the recoil yet was totally inert. The bolt-action rifle was fed by a 20-round box magazine that contained not only the rounds, but also the propellant needed for the 20 rounds. Closing the bolt flooded a pocket behind the chambered bullet with a high-explosive gas mixture which was detonated by a high-voltage spark which gave the rifle a super-fast lock time, and driving the 30 gram 10mm by 60mm bullet out of the barrel at 1200 meters per second. The bullets were made to Match specs with a copper jacket, and the inner core was either the Super High Explosive they used in their 40mm rounds and a contact detonator, or a penetrator made from their armor steel, or a practice round made from an alloy that weighed the same as the penetrator or SHE rounds. The resulting rifle had enough velocity to be extremely accurate past a kilometer in range, so they came up with a new sighting system as well, and ditched the telescopic sights. Some of the guys in the Optics lab were working on a new contact lens that could be remotely activated which included micro-technology that enabled the sniper to shoot with both eyes open, giving him a 3-D, 100 times magnified view of the target day or night as soon as he touched a button in the grip of the rifle. The system interfaced with the Heads-Up Display built into the visor, giving the Sniper all the Squad-level information, including secure digital communications. Since it was going to take a year or more to become proficient with the rifle, Steve located an unused tunnel that was just over a kilometer long in the Earth-gravity dome, and got permission to set up his shooting range. They sealed the tunnel with an airlock to keep the noise of firing out of the rest of the dome, and he was ready to start practicing. Once Steve adapted to the system, he could put a 5-shot group inside the 50mm X-ring out to 1,000 meters after about a year's practice shooting every day. Sheriff Jackson had 10 more rifles and contact lens systems made and stored for later.

Once they were finished with their marksmanship training, they started "Field Exercises", or as close as he could replicate field conditions inside the unused dome. He taught them how to move quietly, patrolling and reconnaissance techniques, ambush, counter-ambush, target designation, communications, the deadly art of booby-trapping and building IED's, and guerilla warfare. Sheriff Jackson finally retired at age 80, but that just meant he could spend more time training "The troops" as he called them since his Deputy was now the Sheriff, and he had all the time in the world. Gradually the troops started training other people, and by the time they were finished, all 600 people who were going to Earth were as trained in Military tactics as possible, and were good enough shooters to defend themselves if necessary.

Sheriff Jackson thought about that, and called the Scientists and asked them what it would take to convert the air-powered rifles to something like the sniper rifle, but semiauto and packing a smaller round. They told him that they could do it easily, and asked if he wanted to keep the air rifles, and build some more explosive gas powered rifles with a 50-round magazine full of solids. Sheriff Jackson said they had at least 10 years, and they should do whatever they could in 10 years to arm 600 colonists with sufficient weaponry to be able to defend themselves against a numerically superior force without armor or air power. The Scientists said they'd get right on it, and 8 years later came up with a lightweight powerful rifle that fired a 15 gram 10mmx30mm round at 1000 meters per second semiauto. It resembled a Heckler and Koch G-

36 on steroids, minus the ejection port, with an under-slung M -203. It was lighter, smaller, and more powerful than the most powerful air rifle in their inventory, and had the same low recoil due to the gyro-stabilization system that resisted recoil. Sheriff Jackson showed them to Rick Jr. who agreed that they were superior to the air rifles, but wanted to keep some air rifles, since the 100 and 200m/s settings were virtually silent, and much quieter than the suppressed rifles they were replaced with. They had plenty of room aboard the spaceship, so they loaded 600 of the new super rifle, 10 million 50-round high strength, light weight disposable composite magazines fully loaded, including the propellant needed. They would biodegrade and turn to sludge half an hour after they were empty and removed from the rifle. To make things simple, the 50 round mags were full of copper-jacketed SPBT rounds instead of AP or SHE rounds, since their grenade launcher took care of that. The guys at the optics lab had been busy, and redesigned the contact lens-based targeting and information systems to include selectable magnification from 3x-100x using either a control keypad on their wrist, or an activating stud in the grip of their rifle. They could use the super-vision mode for detecting objects day or night out to over 1,000 meters depending on conditions. Several units had built-in thermal imagers that could spot a cat at ¼ mile. Sheriff Jackson decided that they must have watched Terminator 1 and 2 a couple of times too often until he tried one of the units out, and he could see better than he ever could in the Corps once he got used to them. He asked if they had enough units to fit all the Explorers with sufficient spares. The Optics guys told him making copies was a walk in the park compared to designing the originals, and they could make millions of copies in a couple of months. He told them to get right on it, and see about issuing some to people in the Lunar colony who either had poor vision, or needed them for their jobs. The thermal units might not be too useful on the Moon, but the zoom magnification and day/night vision capabilities were a hoot!

Preparations to travel to Earth were in high gear, and the Colonists were at 80% Earth Normal gravity, and doing fine. They even looked different from other Lunar Colonists. They were 50% heavier, and almost 6 times stronger than their compatriots were. They volunteered for heavy lifting tasks to gain body strength, and most had been working out with weights to increase their size and strength. They didn't want to be the 90-lb weaklings of Earth! Storage of grains, foodstuffs, medicines, supplies, metals, fabrics, and everything they'd need to be self-sufficient for 10 years was loaded aboard the huge spaceship which was the size of some old Earth Football stadiums. During the 2-year period it took to load and prepare the spacecraft, the Explorers finished adapting to Earth Gravity. They had 50 single men between 18-30 trained as their Military Cadre and Security Force, and the rest of the Colonists were part of the Militia, and were trained in self-defense.

Commander Rick Nelson was in his 80's by now, and his son, Rick Jr. was in his 60's, and was the Leader of the Explorer Colony. Rick and his wife Europa had 4 kids, and 16 grand kids. Their kids were in their 40's, and their grand kids were in their 20's. The entire Colony of over 600 people was going to Earth, and moving that many people that far into the unknown was a daunting task. The spaceship was equipped with the latest sensors to thoroughly survey the Earth before they landed. Jr. met with his Dad and the Council to discuss the best place to visit

first. One councilor suggested they visit the Amish in Lancaster County Pennsylvania. Rick and Jr. were incredulous, so she explained that if any group could stick together, and survive as a community without 21st century technology, the Amish and Mennonites were the best possibility, since they kept their communities as separate from the rest of the US as possible, and already lived without most modern technology. Jr. thought that was as good a place as any to start, so he looked up the coordinates for Lancaster County, PA, and programmed the Navigation Computer to plot an insertion orbit that would leave them 20 kilometers over Lancaster so they could study the area and see if there were any survivors. Rick realized that the Amish's beliefs probably saved them, since they kept separate from everyone else as much as possible, and didn't use modern medicine unless it was an emergency, so they were the least likely to be exposed to the plague. He hoped someone in their communities had decided to build fallout shelters, or this might be a wasted trip.

6 months later, the Earth Explorer set off for Earth. The whole population of the lunar colonies gathered for the big send-off, or at least it seemed that way. Finally the speeches were over, and they boarded the spaceship and got settled. When everyone was ready, and the immediate area cleared, they activated the anti-gravity system, and with a short burst of their rockets, lifted slowly off the lunar landscape. They turned and pointed the nose of the craft toward Earth, or more exactly where Earth would be when they arrived there a day later, and engaged the main drive. 24 hours later, they turned the craft nose to tail, and started a retro-burn to slow down, and disengaged the anti-gravity system, so they'd be captured by Earth Gravity at Normal Earth Gravity like the Computer was expecting. Once they were captured by Earth Gravity, and on course for the United States, the computer started using the Anti-gravity system to slow their descent. Since everyone except the crew was already in their beds, the sudden but slight changes in gravity didn't affect them much. They stopped their descent exactly 20 kilometers above Lancaster County PA, and started scanning for life forms.

Chapter 7

As many people as possible were scanning the surface looking for signs of life. They found numerous large hot spots that they logged into the system, and kept scanning. Once it got light out, they could use the visible light cameras and see what was causing the large hot spots. The next morning Jr. was looking at one of the largest hot spots through the visible light cameras and he could clearly see a farmhouse with smoke coming out of the chimney. He checked the next one, and saw basically the same thing. Dozens of hot spots turned out to be smoke rising from chimneys. That could only mean the houses were occupied. Later in the morning, he went back to the first house, and zooming in, could see people moving around wearing strange costumes. The women were wearing full-length dark dresses, and the men were wearing dark clothes and straw hats. Jr. knew from his studies that the Amish dressed that way, and he had located an Amish Community. His big decision was how to make contact. He decided to go down with his wife Europa by themselves, and take a Hovercraft. No one else wanted them to go by themselves, but he knew that a large show of force could scare the Amish, since they hadn't seen anyone for probably 50 years or more. Jr. made his decision, and it was final. He left all visible weapons behind, and only took his personal stunner when the head of Security demanded that he do so. It was the size of a cell phone, and didn't look like a weapon. Once they were set, they got into a hovercraft, and descended to the planet's surface. They landed in an out of the way spot and walked to the closest house and knocked on the door.

“Excuse me, My Name is Rick Nelson Junior, and this is my wife Europa. We need to speak to anyone in charge.”

The big bearded man in the doorway stood uncomprehending for a minute, since they hadn't used English in quite a while.

“Guter Tag, ist mein Name Franz Yoder.”

Rick looked at his watch, and the Universal Translator switched it to English: Good Day, My name is Franz Yoder.

Rick realized that they were speaking German, so he programmed the UT to translate everything he said into German. When he repeated his previous statement, Franz Yoder's eyes practically bugged out of his head. The device on Rick's wrist spoke fluent German!

He spoke in rapid fire German, and the machine kept right up with him, telling Rick what he was saying in English. Franz told him that his brother Karl Yoder was one of the Elders, but he was welcome to stay in their barn that night, and they could speak to him in the morning. Franz was full of questions, since they had no outside contact for almost 100 years.

Rick decided to tell him their story. Franz was amazed that anyone would want to live

anywhere but here on God's green Earth. Rick explained that over 50 years ago, before the Big Bang, scientists had the technology to build permanent bases on the moon, and thought that in case we were stupid enough to succeed in killing ourselves, that a remnant of Humanity would survive and hopefully 1 day repopulate the planet. Rick said that he was glad that they had survived, and asked him if he knew of any other communities that had survived. Franz told him most of the Amish communities survived, and they numbered almost 5,000 adults between 10 communities. Knowing that the Amish only counted adults who had been baptized as community members, and they usually had anywhere from 4-8 children per family, that could mean upwards of 15 thousand people alive in this one area of the US. Maybe there was hope after all of repopulating the planet.

Later than afternoon Franz invited them in for dinner, and Rick politely declined, thanking Franz for his hospitality, but since they didn't share their beliefs, he didn't want to offend Franz accidentally, and he would feel much more comfortable sleeping in his own bed. Franz seemed grateful that Rick had turned him down, since he was required by his faith to offer, but was afraid of having two non-believers under his roof for the night. Rick asked Franz where and when they should meet tomorrow. Franz said "Right here right after sunrise." Rick checked, and the sun rose here at 0600 local, so he'd have to get home and get some sleep. Franz suggested they meet with all the Elders tomorrow, and then turned to leave. Rick and Europa walked back to their Hovercraft and flew back to the ship. Everyone was full of questions, so Rick made a general announcement that they had made contact, and there were at least 15,000 Amish and brethren alive in the US. That news was welcome, and Rick told his second-in-command that they had to go back tomorrow and talk to the Elders. Rick and Europa went to bed, and were back at Franz Yoder's farm at 0600 local. This time they landed the Hovercraft in an empty field next to his barn. Franz was amazed by what he saw, and Rick quickly told him that they were as human as they were, it's just their technology was very advanced.

Franz finally blurted "You drive on the air like our buggies ride on the roads!"

"That's a pretty accurate description of what we do. How far away is this meeting?"

Franz told them, and Rick's translator said 5 Kilometers. That was too far to walk, so Rick asked Franz if he could ride in their hovercraft. Franz said as long as he was a paying passenger, he could, so he handed Rick a small silver coin, and they climbed aboard. Rick decided to follow the road, and not get more than 10 feet above the road in deference to Franz. 10 minutes later, they were at Franz's brother Karl's farmhouse. There were numerous black horse-drawn buggies out front, so Rick parked off to 1 side so as not to spook the horses. He didn't need to bother, since the hovercraft landed noiselessly. Franz's brother Karl was waiting for them with a stern scowl on his face. Franz walked up to his elder brother, and had a terse discussion with him that Rick only caught part of. Finally Karl said "We will talk to you, but feel we really don't need or want anything you have."

"Karl, I understand your customs, and mean no offense. We will respect your wishes in that

matter, and all we were asking was for your help in locating other less conservative communities that might be interested in talking to us. If you'll accept a gift, I wanted your community to have an Emergency Communicator to contact us in the event of an emergency, since we have advanced medical technology we are willing to share to save lives."

That got Karl's attention; the Amish didn't forbid the use of modern medical technology, especially where it could save a life, or ease pain and suffering. Rick handed Karl a communicator, and told him if they had an emergency, to press that big red button, and talk to whoever answered it and tell them the nature of their emergency. They didn't have any medical aid stations set up yet, and when they did, he'd appreciate the return of the communicator unless they felt there were other emergencies that Rick's colonists could help them with. Karl was grateful that Rick had made it clear that the device was on loan and for medical or other emergencies, or he couldn't accept it, since they belonged to a Conservative Old Order Amish Community. Karl shook Rick's hand, then bid them goodbye, telling them that Franz could get a ride home with one of the other elders. He turned quickly back, and remembering one of Rick's questions, told them where some less conservative Mennonite and Amish Communities were located. Rick thanked him, and climbed back into the hovercraft, and took off. Seconds later they were gone from sight.

The next day, Rick decided to contact several of the local Mennonite communities and try their luck there. This time Andrew, their Security Officer insisted they have some "company" with them, at least 2 personal bodyguards, and a pilot and gunner for the Hovercraft. Rick thought this was overkill, but could tell Andrew wasn't kidding and would "pull rank" if he had to. The next morning, their hovercraft flew down and located several of the communities Karl had pointed out. After some rather interesting and somewhat tense moments, they realized 1) The ship could easily destroy their entire community if it wanted to, and 2) for some reason they weren't making any hostile moves. An older man came out waving a white flag, and Rick stepped out by himself. Gunter spoke pretty good English, and Rick didn't need the translator. Rick explained who he was, and what he was, and why they were there in as few sentences as possible. When Gunter realized that they were peaceful, and originally from Earth, he dropped his white flag to the ground, the All Clear signal, and the main door to this fortress-like building opened up, and his wife Helga came out. Rick spoke into his communicator, and Europa joined him a few seconds later.

The foursome introduced each other, and had an interesting conversation. Unlike their Old Order Brethren, this Mennonite Community had Television, and watched the news, and selected Television programs, so they knew about the Lunar Colony. To actually meet someone who was born on the moon was simply too amazing to believe. Rick decided to show them a couple of things that were unknown on Earth, and that convinced them. Their technology was light-years ahead of Earth's especially after the Big Bang. Rick had guessed correctly, and the Amish and Mennonite communities were the most well off and civilized communities in the US. Almost all other communities were run by warlords, dictators, lunatic religious fanatics, and others who preyed on those who weren't prepared to defend themselves. The Mennonite

Communities had taken upon themselves to protect their brother Amish who refused to kill someone else to save their lives. The Mennonites didn't have that problem, and anyone who mistook them for a Pacifist Amish community normally found out the hard way when they fought back and the attackers died in huge quantities. Rick heard that, and asked them if they needed any improved weapons to defend themselves. Gunter said "Ja, we would be in your debt, as would our Amish brethren." Rick made a quick call, and one of their bodyguards came out with his personal weapons. As Rick explained what the weapons were, and what they could do, Gunter said "You're an answer to our prayers. A large gang of scum of the earth is headed this way from Cincinnati, and will be here within a week, and we know we can't defeat them."

"What kind of weaponry do they have, any tanks or air power?"

"No, they stole equipment from a National Guard Armory, but didn't have anyone who could fly or drive an Abrams tank. All they have are Bradley Fighting Vehicles, Ballistic Hummers, and a whole bunch of trucks mounting Ma Deuce Machine guns."

Rick ran the information through his computer, and decided they were no match for both of the Hovercraft. It would take over a week to arm and train the Mennonites with the new weapons, but both of their Hovercraft would make short work of the scumbags. Rick got detailed information about the pending attack, the route they were taking, and their estimated strength. He spoke to Andrew, who reluctantly agreed, since it was easier to take them out themselves than training the Mennonites in the short time available. Gunter said the best ambush would be when they were road bound on Interstate 76 East about 50 miles west of them. He showed Rick on a map a perfect spot for the hovercraft to catch them all bunched up in a convoy, and decimate them before they could escape. Rick asked Gunter how long they had, and he guessed they were on the road already since they couldn't travel fast with the extensive damage to the roads due to the lack of maintenance. It would take them roughly a week to travel from Cincinnati to where they were, between clearing the debris, and scavenging the fuel. Rick asked the obvious question why the group from Cincinnati was attacking them. Gunter explained that the warlords wanted the Amish supplies, and to make slaves of them, and especially their young women for his prostitution rings. He could get enough money out of selling a young virgin to keep him in crack for a year. That idea so revolted Rick that he wished he'd brought some Thermonuclear weapons with them so they could level Cincinnati, then he realized that there might be some innocents or prisoners being held against their will who didn't deserve to die. He called Andrew and modified his previous orders, and told Andrew why. They would take no prisoners, and no quarter was to be given. They were to completely annihilate the group heading down I-76. They turned the sensors onto I-76, and spotted the convoy 100 miles away, making maybe 20 miles per hour. Rick said he had to go, that they'd be back after they dealt with the dirtbags, and took off for the Spaceship. As soon as he and Europa got off, 3 gunners climbed aboard, and they brought all the extra ammo for the guns they could carry safely. Once the guns were loaded, both hovercraft set off to deal with the warlord's convoy. They arrived at the ambush point, and stayed high to observe the convoy. Several Skull and Crossbones flags could be seen flying from antennas, and they were sure that

they weren't attacking a Sunday School Class. The 40mm auto cannons went to work, and 2 minutes later, the 20mm cannons mounted in their turrets finished the job. A 10-mile long convoy was now a smoking pile of rubble. They returned to base to rearm, and Rick flew back to the Mennonite compound to give them the good news. When word got back to the weapons designers on the Moon, they were elated that their 40mm super-high explosive rounds worked better than a 120mm HEAT round against armor. Every Bradley was completely destroyed, and several Hummers were reduced to unrecognizable pieces. Sheriff Jackson heard about their easy victory, and hoped they didn't get complacent. Taking a bunch of thugs out while their road-bound in a convoy is one thing, fighting house to house or guerilla warfare was totally different. He highly doubted they'd get to attack against a road-bound enemy again.

Chapter 8

The next morning Rick and Europa met with Gunter and Helga.

“Gunter, I did some checking, and the Mennonites, and almost all Anabaptists, practiced Pacifism, yet you were telling me that you were protecting the Amish community.”

“Normally we’re Pacifists, and some of us couldn’t take up arms, even to protect ourselves or our brothers, so we excused them. Thankfully we haven’t killed anyone, but we’ve come close. We were praying the other day that your group would be willing to help defend us and the Amish, then we realized that it wouldn’t be fair to you to ask you to risk your lives for us.”

“Gunter, we need a base of operations, and we were hoping there was some nearby farmland we could have with plenty of room to expand. We’ve already offered Medical Services to Karl Yoder and his Amish Group. I’d have to discuss it with the rest of the Colony, but defending this whole area with the technology we have shouldn’t be too difficult, especially if we take out all the nearby warlords right off the bat.”

“We’re the only major population center between here and New Jersey. There are literally millions of acres of land available for farming between here and there. Your hovercraft will have no problems with the poor roads.”

“Great, if you wouldn’t mind taking a ride in our hovercraft, and show us where the best farmland is, we’ll drop you back off here.”

Gunter said goodbye to Helga, and they got into the Hovercraft. Gunter was amazed at how silently the hovercraft traveled. He pointed out several thousand-acre sites to the Southeast of his village, and Rick logged them into the navigation system. He noted that they had water, trees, and flat arable land in 5 square kilometer size lots. Gunter told them there was a bunch of abandoned farm equipment, all they’d need was diesel fuel to power them. That stopped Rick cold, all their equipment was powered by small fusion reactors, and he guessed it would be too difficult to convert the equipment to run off electricity produced by a small reactor. He asked Gunter, and he said he had little or no knowledge of such things. Rick realized he had experts aboard the spaceship that would know. Rick thanked Gunter, and flew him back to his farm, then handed him a communicator, and told him how to use it. Europa said goodbye to Helga, and they climbed back aboard the hovercraft.

“Rick, you would be amazed by these people. Their society has been stable and self-sufficient for about 300 years! We could learn something from them.”

“You mean give up technology, no way!”

“Not that, but the way they work together, and with the environment instead of fighting it.”

“I agree Europa, when we start planting, we’re going to have to check with them, and hopefully they can show us the ropes. I just hope the Scientists can convert 21st century technology to run on 22nd century power sources.”

Once they got back to the Spaceship, Rick called a meeting of the Executive Council and put it to a vote. There were several ultra-liberal Pacificists on the Council, but he only needed a majority instead of a unanimous vote. 8 out of 10 council members voted to settle where Rick suggested, and set up to farm and defend the local Amish and Mennonite people. Rick thanked the Council, and made his way to a group of Scientists, Engineers, and Craftsman who were meeting to discuss the possibility of farming the Earth again. Rick told them about the Diesel powered equipment, and one of the Physicists suggested a Tesla Power System. He explained how it worked to Rick, and he thought it was ingenious. Now all the equipment would need was the right kind of antenna, and electric motors. Hopefully they could locate or build some huge electric motors. The Scientists suggested bringing the equipment to them first, and they might have something even better to run them when they got finished. He asked the Engineers and Craftsman if they could build several more Hovercraft, arm and armor them, and possibly build some fixed defenses for the farms themselves. They said they’d get right on it since they already had the plans, and sufficient quantity of all the metals they’d need.

The next day Rick and Europa flew over to Gunter and Helga’s farm to treat them to the sight of the space ship landing. They stood there with their mouths hanging open as the huge ship, which was the size of a football stadium, set down without a sound, then the ramps opened, and hundreds of people got out to stand on the Earth for the first time in their lives. Several were crying, and a few kissed the ground, then spat it out when they realized that Dirt tasted well....like Dirt! Rick turned to Gunter, and asked if they could help them build farmhouses like theirs. Gunter said they had the knowledge to build houses, but they would need several hundred houses and quickly. Rick said they had technology that could fell and saw any trees to the exact sizes needed, and transport the load to any spot within range of the hovercraft. And do it much quicker than their hand tools could. Gunter reminded Rick that he couldn’t personally use any modern tools, but he’d be more than happy to help design the houses, and teach them how they built houses to last. Several houses were hundreds of years old.

Rick called several people over, and they conferred with Gunter, and came back hours later with a dozen chainsaws unlike anything Gunter had ever seen. Lunar metallurgy was also way ahead of Terran technology. They quickly built several sawmills, and flew over to a huge stand of trees, and later that afternoon, they were all on the ground, and being de-limbed. The next day, the hovercraft picked up all the logs, and dropped them neatly next to the sawmills. Gunter showed them how to join corners with pegs, and they fashioned thousands of pegs exactly the same size, then milled the ends of the logs exactly the size needed to fit together, with a precisely located hole for the peg. The Mennonite Men arrived later that day, and started assembling farmhouses on each site. Gunter explained that even with the modern technology,

they should have at least 4 kids each to help with “chores”. Once the houses were built, they had all their furniture and appliances installed. Due to the lack of liquid fuels, they decided to use wood stoves for cooking and heating like the Mennonites and Amish used. Once they had the first 6 houses built, the Lunar Colonists told Gunter that he could send the work crews home, they’d recorded the entire process, and taken extensive notes and measurements, and could build copies fairly quickly. They even copied their furniture and appliances, and were programming machines to replicate them.

Gunter asked if he could see these machines working, and see the finished product. Rick flew him over to the machining plant they set up, and Gunter was amazed at all the machines they had built in several days, and marveled at the set of Table and Chairs that they had just finished making. It was a perfect replica of their furniture, but he could tell that it was machine built because there were no tool marks on the wood. Gunter told them the furniture was perfect, and asked Rick to fly him home since it was time to milk their cows. Rick told Gunter that he hadn’t seen the rest of his farm, and was hoping Gunter could show him how to milk a cow. Gunter laughed, and said “Sure” then they flew back to Gunter’s farm. Rick was amazed at the size of the cows. They were easily the biggest animals he had seen. Seeing one on a computer screen versus up close and in person, with the unique aroma of a cow almost overloaded his senses. Gunter called his children, and the cows walked right into the milking barn as Gunter’s son Jaeger filled the feed bins for each cow. They walked right up to their stanchion, and all the kids grabbed a stool and a pail. Gunter washed his hands, and told Rick to wash too, so he wouldn’t get anything on the milk. Next they rinsed the cow’s teats and udders, and finally Gunter sat next to his favorite cow and talked to her in German. Finally, he set his hands gently on her teats, and squeezed and pulled each one gently, allowing the milk to refill between each pull. After a couple of minutes, he asked Rick to take over. Bessie immediately noticed the strange cold hands, but Gunter’s soothing words calmed her right down. After a couple of minutes, Rick got the hang of it, and Gunter said he had other cows to milk, and he’d appreciate if Rick could finish Bessie. Rick turned back to this work, and soon was milking away. When Bessie was totally milked, the pail was almost full of a yellowish white substance. Gunter suggested that Rick not drink it, since it wasn’t pasteurized, and it might have some bacteria in it that he wasn’t immune to yet.

Several hours later, Rick realized it was getting dark, and had to get back to the Spaceship. He flew back, and landed outside. After a quiet dinner with Europa, he contacted his Dad, and asked him several questions. Commander Rick Nelson was glad they had decided to stay on Earth and help re-populate his home planet, and help out the Amish and Mennonites. During his tour of duty in the Military/Peace Corps he spent time with the Amish and Mennonites who were serving their Community Service in lieu of mandatory enlistment, since the draft was back in force. He had made friends with several of them, and wished he could live as simply as they did. Snapping back to the present, he told his son that the lunar factories could build several dozen armed and armored hovercraft quicker than they could, and they’d ship some other stuff including several fusion reactors, and all the hardware they’d need to install Tesla Power transmission systems for their whole colony. Rick Jr. had already decided to call the new

colony Terra Prime. His Dad thought that was an excellent idea, and told Jr. to send the shuttle back to the moon as soon as it was empty. Jr. said that might be a year or two, since the colonists were living it while their houses were being built since working in Earth gravity building Amish style houses was tough work, even with modern equipment. His Dad said he'd talk to the Council about building a transport vehicle to transport cargo between the Earth and Moon, since it didn't need to be armed, armored, or carry 600 Colonists; it should be able to carry tons of cargo.

Rick Jr. thought that would be an excellent idea, since he had anticipated a regular Earth-Moon shuttle, since there were some things, like coffee, that they couldn't get on the Moon, and there were several things he wanted on Earth that were quicker and easier to make on the Moon. After exchanging pleasantries, they signed off. Rick told the Lunar Council that they needed to get going ASAP, since the Colony Ship was basically staying on Earth as an Operations base, and the Earth Colony needed at least a half dozen more hovercraft, and several fusion reactors and the hardware to set up a Tesla Power Transmission system. They agreed, and got to work immediately.

Meanwhile, Rick Jr. was meeting with his executive council about plans to stay on the Earth and help repopulate it. His news about warlords and other assorted dirtbags was expected. When they heard Gunter's reports of Child Prostitution and Slavery, the ultra-liberal council members kept their peace, and even agreed that they needed to do what they could to help rid their immediate area of any threats, and try to save as many slaves as possible. With the agreement of the EC, Rick worked with his Security Chief, and the Troops to plan for the defense of the colony and the surrounding area. When his Security Chief heard that they were installing a Tesla Power system, he got the details, and had an excellent idea. Since anything with a properly tuned antenna could receive the energy if it was in range, he decided to have a bunch of ROV's built to keep an eye on the immediate area, eliminating the need for roving patrols. Since they didn't need batteries, they could fly 24 hours per day, circling over an assigned area, and they could put up enough to have a 200% overlap of camera coverage even if they sent them out far enough to cover the entire county. He modified his plans to include an outer and inner ring of reconnaissance ROVs so he could double his chances of spotting anything nearby that might be a threat. He also wanted several satellites in Geosynchronous orbits to keep an eye on things. A constellation of 5 satellites could keep a 500-mile radius around them under constant surveillance. Outside that area, they could use satellites that swept North America several times per day to keep an eye on everyone else. He also had to launch a series of Navigation satellites ASAP. He'd ask Rick to have the next incoming Shuttle place the satellites instead of displacing everyone around Terra 1, their colony ship.

He got the factories working on building ROVs that would work unsupervised 24 hours per day. The optics systems were already built and stored on the shuttle, since the Optics lab guessed that they'd use some sort of ROV to keep an eye on things. The day-night cameras had a huge zoom and magnification factor to watch anything between 10 square miles and 10 square feet day or night. The computer could be programmed to detect size and movement. If it was

human-sized or bigger and moving, it alerted the operator, who could zoom in for a positive ID. He thought about camouflage, and checked on adding the heartbeat detector to the sensor package. Now even someone wearing visible and IR cammo would get picked up by the sensors, since he didn't know of any way to hide a human heartbeat from the heartbeat sensor. As soon as the ROV's were built, he located a small unused fusion reactor, and connected a smaller Tesla system that would give him a 5-mile radius, and decided to launch enough ROV's to blanket the area. 2 members of the Security Force monitored the cameras and did other stuff in the Security office in 8-hour shifts. He told the SF members the computer would warn them if it saw anything, so they only needed to be close enough to hear the computer's warning. After several false alarms, they were able to program the computer to ignore cows and other animals that belonged there. The computer had an image recognition program loaded as well, and it fed the data from the cameras into the IR program before it sounded the alarm from now on. Rick told Gunter they were monitoring a 5 mile radius around their base, and to tell anyone from his group to let them know before they got closer than 6 miles. Gunter remembered the firepower he saw on the hovercrafts, and warned the entire Mennonite Community to stay at least 10 miles away without telling him that they were going, or they were liable to meet a premature end.

Over the next couple of months, the space ship had more and more space available as Colonists moved into their own homes. A bunch of Mennonite women volunteered to teach them how to cook using a wood stove, and they were soon creating fantastic, never imagined dishes with their wood stoves, and cast-iron pots and pans. The scientists pored over the combines and tractors, and decided that if they replaced the Diesel engines with Electric Motors, as soon as they got the huge Tesla installation, they could power all the equipment and appliances from the same fusion reactor. They had brought sufficient Hydrogen isotopes to power their fusion reactors for hundreds of years. They started building the huge electric motors, since they decided it would be quicker and easier to replace the diesel with an electric motor instead of rebuilding the equipment for multiple motors. They located a huge quantity of hydraulic fluid and oil at the Farm Equipment Dealer. By now what diesel they could find was so badly decomposed to be useless. Any new vehicles they would build would use a smaller electric motor in each wheel for travel around the Colony, since they needed the Hovercraft for defense. They settled on a 50hp DC motor and built hundreds of them. The combines and tractors would need either 2 smaller motors or 1 big motor. Since the hydraulics weren't used full-time on the tractors, they decided that 2 smaller motors would work great. They started installing the motors even before the big Tesla Power station was installed. Rick knew that the Shuttle would be landing in a month or so, and asked Gunter if he knew where he could get a huge quantity of Coffee and Tea. Gunter said there was a Food warehouse in the next city over, and they had cases of coffee and tea in vacuum-packed cans that should still be good, since that was where they got there's. Rick got the exact location, and flew over in a hovercraft with an armed escort. Just as Gunter had said, there were pallets stacked to the ceiling full of coffee and tea. Rigging a cargo net, they hauled a dozen pallets of each back to the spaceship. He hoped that this was what his Dad wanted. Gunter heard about what Rick was doing for his Dad, and contributed 10 gallons of pasteurized milk, and 100 pounds of beet sugar. When the Shuttle

landed the next week, they offloaded a dozen armed hovercraft, boxcars full of 40, 20, and 10mm ammo, 5 fusion reactors, and all the hardware necessary to install 5 huge Tesla systems. Rick Sr. had thought ahead, and shipped enough systems to power the next 100 years worth of expansion to the colony, and enough ammo to protect it for 100 years. Rick loaded the coffee, tea, sugar, and refrigerated milk aboard the shuttle. 4 days later, his Dad was on the video phone with tears in his eyes. He thought he'd never get to drink coffee with real milk and sugar again in his life. "Junior, you made your Dad very happy, thanks!"

Junior teared up a little too, and said "It was the least I could do, it would take years to grow fresh beans, and I wanted to make sure you got to enjoy it now."

After they hung up, Junior was amazed at how much stuff his Dad had shipped them, and got the engineers busy installing the Tesla Systems. The Shuttle had inserted the satellites on its way in, and they were just starting to send images to Terra Prime. So far there wasn't any direct threat, but several nearby cities showed signs of recent occupation.

Chapter 9

Rick Jr. debated whether or not he should deal with the Warlords and assorted dirtbags first, or get his community set up. He compromised and decided to get a couple of the closest threats neutralized first, then get going on building up the colony. He picked up Gunter, and introduced him to his Chief of Security, Keith Hunter. Together they formulated a plan to take out the nearest bunch of Dirtbags in New Jersey. Gunter said that there was a small group hiding in Philadelphia, but they just wanted to be left alone, and the huge group in New Jersey had settled in the western suburbs of Trenton NJ. They moved around, but Gunter thought they were based in Morrisville, and were raiding what was left of Trenton, and they had raiding parties attacking small groups of survivors as far away as Maine and Virginia. If they kept watching the major interstates, they'd pick up their raiding parties eventually. Rick thought taking out the Raiding parties first would be a good idea, so he got Keith to concentrate on the major interstates. Gunter told them any convoys of more than 3 vehicles were probably raiders, since anyone who had survived and wasn't raiding was short on Gasoline or Diesel, and didn't travel much out of their immediate areas.

2 days later, Keith reported a 6-vehicle convoy moving North on I-83 from Baltimore, and it contained 2 LAV-25's. Rick called Gunter, and he said that they were probably Spike's southern group of Raiders, since they had stolen a bunch of LAV's from a Marine base years ago, and used them to terrorize his neighbors. Rick didn't need any more info, and dispatched 2 Hovercraft to deal with them. They came back later after expending 10 rounds of 40mm, and told Rick that he could scratch 1 group of Raiders. A week later, they spotted another group of Raiders heading West on Interstate 84 from Hartford, CT. Rick dispatched another pair of Hovercraft, and they came right back after firing 12 rounds. A week later, they caught another convoy motoring east out of Philadelphia and wiped that out. In a month they had destroyed around 40 LAV-25's, and they knew they had seriously degraded the Warlord's ability to fight and terrorize his neighbors, but Rick wasn't finished with him just yet. He had 2 Hovercraft maintaining surveillance over his compound. He'd taken over a High School building in Morrisville, and vehicles were running in and out of there all day. They could see teenage girls being carried into the building hogtied with duct tape, and occasionally saw an execution and the dumping of a body. They zoomed up on the body, and it was almost always female, but barely recognizable. When they could see the face, it was terribly distorted with fresh and older scars from beatings and torture.

Rick had a tough decision, should he blow the entire compound into low orbit from a safe distance, or risk his colonists' lives in a rescue attempt? Gunter solved his problem for him by telling him that Spike got the women hooked on Heroin within hours of coming under his control, and even if they could be rescued, they would be addicts the rest of their lives. Rick had no experience with Drug addiction, and asked his medical people if they could cure it. They told him they could detoxify them, but the odds of them living a normal life afterward were dismal. Rick realized that each of his people were worth maybe hundreds of people living

under the Warlords. He called his Dad, and his Dad agreed that they shouldn't risk colonists' lives for the marginal people they'd save from the Warlords. They'd risk their lives for colonies not under the Warlords' control like the Amish and Mennonites, and other isolated communities, but anyone under Warlord areas was probably already a lost cause. With that decision made, Rick ordered half his hovercraft to destroy Spike's compound totally, and to shoot any Raiders trying to escape. The troopers understood the reasoning behind Rick Jr's orders, but they didn't have to like them. They were trained to save lives, now they were exterminating people just like themselves. Rick sat them down and talked to them when he heard rumors and grumbling.

“Look guys, I could send you guys in, and take 10-20% casualties rescuing maybe a dozen or more prisoners from the hands of hundreds of dirtbags. From what Gunter told me, these women are already hopelessly addicted to Heroin, and we don't have any Heroin. Even if we managed to save them and detoxify them, over half of them would return to Heroin as soon as they were out of our control, and their only way to get Heroin would be to go to another Warlord. So basically you're asking me to kill 5 of you to save 25 women, half of which would return to Heroin, and probably tell the Warlord where our compound is. I don't like those odds, and there are many more warlords than just this guy in New Jersey. We'll have to deal with several of them before we are relatively safe here. If you can't do this, let me know right now, and I'll replace you, but whoever we replace you with isn't as well trained, and wouldn't have as good a chance of surviving combat, so it's your call.”

Keith Hunter talked to the Troops, and they decided that it was a dirty job, but someone had to do it, and they were the best trained for it. Keith put 12 numbers in a box, and drew lots to see who'd go on this first mission. 6 Hovercraft took off at dawn. 4 hours later they came back, and said that the High School at Morrisville was now a smoking hole in the ground, and they had shot several dozen vehicles trying to flee with the 20mm guns, and destroyed them as well. Rick hoped he had solved that problem. He asked Keith to keep an eye on the area to see if anyone took over.

2 weeks later Rick talked to Gunter, and he said there might be another warlord near Cleveland Ohio. Rick called Keith, and asked him to keep an eye on the Cleveland area. He called back several days later, and told Rick that he had spotted several APCs driving around. From his conversations with Gunter, Rick knew that the Army as an organization had ceased to exist over 50 years ago, and anyone with Bradleys, APCs, or Tanks was either a renegade, raider, or a Warlord. Rick had a hovercraft check them out, and monitor their radio transmissions to see if they really were Raiders or Warlords. He was hoping they were Renegades, and could be brought back under control once they realized that his Colony had them badly outnumbered and out-gunned. They seemed to have a military precision to their communications, and the Hovercraft crew paid attention to what frequencies they broadcast on, and their command structure. It seemed a Colonel Kirby was in charge. Rick Jr. called his Dad, and they set up a 3-way communication with Colonel Kirby.

The next day Colonel Kirby was in his office when his radio blared “Colonel Kirby, this is Commander Rick Nelson calling from Lunar Prime. My Son is nearby, and wishes to talk to you.”

“Commander Nelson - Right! Whoever you are, you’re in big trouble pirating a Military Frequency!”

“Colonel, this is NOT a joke - I’d highly suggest going to your Comm Shack and I’ll call you back in 5 minutes, and prove that I’m calling from the Moon.”

“OK, since I’m not busy, I’ll humor you, but if this is a joke, I’ll track you down and kill you!”

5 minutes later, Commander Nelson called back, and Colonel Kirby had his radio technician trace the origin of the transmission. 2 minutes later, the RT was as white as a ghost.

“Colonel, according to my DF equipment, the signal is coming from the moon, and is so powerful that it’s almost overloading my equipment.”

Commander Nelson called back again “Colonel, by now you’ve established I’m calling from the Moon, and my signal strength is practically melting your receiver. My Son will be landing a hovercraft next to your office in 2 minutes. YOU will meet the craft alone and unarmed, or they will destroy your facility and command from a range that you cannot defend.”

As he stepped out of the Comm Shack, a huge spaceship settled down noiselessly next to Colonel Kirby, and a door slid open.

“Colonel Kirby, excuse the rude and sudden appearance, but we need to talk to you since you seem to be the only competent Military authority in your area. Please climb aboard and we’ll talk in the air.”

Colonel Kirby walked through the door, and took the offered seat. Seconds later they were thousands of feet in the air, yet he felt no acceleration or heard any noise.

“How the hell did you do that?”

“Anti-gravity and fusion reactors. We’ve been busy on the Moon the last 50 years. While you’ve been trying to survive, we’ve advanced technology 3 generations. This single hovercraft has enough firepower to level your entire command. I know you’ve been out of touch for a while, and are acting like renegades since there is no central command. We can destroy you out of hand, but we’d rather a live and let live arrangement. If you promise not to raid nearby towns and take prisoners or supplies, you can continue to live. If we see or hear of any problems, we’ll level you. If you need help, you can contact us with this communicator. All it does is transmit an ID number and your location so we can contact you. Don’t even think of

attacking us, we have you under 24-hour observation. Do you have any questions?"

"Do you have any medicines or supplies to spare? We're short on supplies, especially meds and medical supplies."

"We don't have enough to give you enough to really matter. We need to either find some or make some. Give me a list of what you need, and as soon as we get it, one of our hovercraft will deliver it. Any attempt to attack or take the hovercraft will also result in your destruction."

"OK, I get the hint, you can kill us any time you like! Don't worry, we won't try anything stupid. We really need supplies, especially medical supplies. We've already stripped all the local medical supply distributors, so you'll have to find an area at least 500 miles south of here to locate anything we haven't already cleaned out."

Ok, Colonel. Thanks for your time, we'll be in touch."

2 seconds later, Colonel Kirby was standing stunned and amazed on the ground. He was wondering if he was dreaming when he saw the huge hovercraft lifting back into the sky. He ran into his Comm Shack and called his officers to an emergency meeting.

"Guys, there's a new Sheriff in town. Seems the people on the moon have decided to come back to Earth. Their technology is several generations ahead of ours, and I believe them when they say they can level this entire area if they wanted to. They offered us a live and let live arrangement as long as we don't abuse anyone living in nearby towns, and take their supplies or take them prisoner. They say they have us under 24-hour surveillance, and I've no reason to doubt it. WE could do it 50 years ago with our existing technology, and they're hundreds of years ahead of us. The good news is they promised us supplies, especially medical supplies. You need to recall all the Patrols, and give them the word."

"How do we know you're telling the truth?"

"Gene, just try something stupid, and they'll flatten you. Just tell me in advance so they don't blame me, and level this place."

Gene stormed out of the meeting, jumped into his Jeep, and drove off. Colonel Kirby walked away from the officers, pressed the button on the communicator, and Rick's voice came on.

"Colonel, you have an emergency?"

"One of my officers doesn't believe you. He's headed south to cause trouble. His command is about 20 miles south in Parma. If you could give him a little demonstration without destroying him, I'd appreciate it."

Rick turned the Hovercraft around, and quickly was following the speeding jeep. There was a bridge a mile ahead, and he aimed the 40mm auto cannon onto the center span, fired a single round and blew it sky high right in front of his Jeep, then lowered the hovercraft down to 20 feet above the roadbed with the 40mm cannon facing directly at Gene's Jeep. Rick clicked the PA.

"Sir, this is your first last and only warning. Good day!" Gene looked out his windshield at Death, and peed his pants. He heard the announcement, and watched the hovercraft zoom back up to altitude without making a sound.

Chapter 10

Rick flew back to the Colony's base of operations. He met with Gunter, and realized that the growing season here was fairly short, and he talked to Keith, and they decided to build some underground sections so they could grow food year round, and have an emergency shelter for non-combatants in case they were attacked. Rick called his Dad, and made a request that a TBM be sent to Earth on the next shuttle. When he told his Dad why he wanted it, his Dad agreed in a heartbeat. Earth had more than enough water and air to make growing food underground an easy project with their technology, and if they went deep enough, someone could pop a nuke directly overhead, and they'd never know unless the sun shields were open at the time. Jack thought about that, and realized they didn't really need natural sunlight with fusion reactors making all the electricity they needed.

Rick explained what he wanted to do to Gunter, and asked if the Mennonites would like an underground shelter in case they got attacked. Gunter said he'd take it up with the Elders and get back to him. Rick asked him if he could ask Karl Yoder, since if they asked, he would be more likely to say yes than if Rick showed up. Gunter laughed and said "You English do tend to set him off!"

"Gunter, I'm not English, I'm from the Moon!"

"Sorry, it's a colloquialism us Anabaptists use to refer to non-members. There's no offense meant by the term, since most of us are from German stock, and the original settlers here were from England, so it kind of stuck. I'll ask Karl, but I already know his answer."

"Just explain to him it's for emergencies, and if he wants to they make great root cellars."

"That might swing him to getting one, as long as they have absolutely nothing to do with any of your high-tech stuff. Also, they don't have electricity in their houses."

"Yet the towns here had electric stop lights and lights?"

"I'll make that distinction to him and remind him that these aren't designed to be occupied except in a dire emergency. They can make exceptions to the Ordnung to save a life on a case by case basis. If someone needed to be transported by ambulance, they can do that."

"Ordung, I've heard that word before?"

"It's the unwritten rules we live our lives by. It includes Simplicity, Modesty and Humility, and Separateness. It would take a long time to really explain it to you since you weren't born into an Amish household, but it's based on the Lutheran German Bible, which would be similar to the English King James Bible."

Two weeks later when the Tunnel Boring Machine showed up, Rick flew Gunter to the sites they were thinking about boring. The first 1 Gunter approved of, saying that it was solid Granite, which was why the Mennonites moved their farms north, so they wouldn't have to deal with the huge granite outcroppings. Rick asked him how deep the water table was around there, and Gunter said it could be anywhere from 10-100 feet before they struck water, depending on the local conditions. Looking around, he showed Rick that the trees weren't the type that indicated shallow water, so they should be OK digging there, but 5 miles to their east, they might hit an underground river, since the whole area was full of artesian wells. Rick asked if running the tunnel and domes North-South would be better. He said that they should be in this formation for the next 10-20 miles if they stayed North and South instead of East and West. Rick was glad that Gunter was his friend, he didn't think that even the water pumps they had available could deal with an underground river. He asked Gunter if he wanted to watch it at work. Gunter said yes in a heartbeat, so Rick had the area cleared, and several Engineers programmed the TBM to dig down 500 feet, then start making a dozen domes connected by short tunnels. As he explained the process, Gunter asked how a Tunnel Boring Machine could make 200-foot high domes out of bedrock.

“Power, Gunter, Terra-watts of Power! We installed powerful lasers on board the TBM to fuse the walls surrounding the tunnels we bore, then when we get to where we want a dome, a computer program activates several Terra-watt lasers that practically vaporize the rock until they reach a pre-determined depth. The computer controls the depth and sweep pattern of the lasers, which results in a smooth hemispherical underground dome 2 miles in diameter and 200 feet high at it's center that will remain airtight through an earthquake, or even a near-miss by a nuclear bomb. On the moon, we pressure tested them to 2 atmospheres, or double the air pressure on Earth at Sea Level, and they held for 2 weeks without any leaks.”

“Wow, I'd like to see the results of that!”

“If your Elders agree, we could build an underground complex just like ours. With a fusion reactor, you'd be generating your own power, with no connection needed to the surface.”

“I thought the only use for Fusion was to make Hydrogen bombs?”

“We've gone way past that on the moon. One of our Scientists perfected the Magnetic bottle, so we could use a controlled fusion reaction to create huge quantities of energy without any danger of a chain-reaction. The system is designed to shut-down if any abnormality is detected. As soon as the magnetic bottle's pressure is reduced, the fusion reaction stops automatically.”

“I'm going to have to talk to the Elders about this one.”

“If you want me to, I can go with you to answer their questions. My Universal Translator would allow us to conduct the meeting in any language they feel comfortable with.”

“Ok Rick, I’ll ask them, thanks for everything but I have to get back to get going on my chores.”

Rick flew Gunter back home, and by the time he got back the TMB had disappeared below the surface. He didn’t know how long it would take to bore tunnels and caverns in the much denser soil and rock of the Earth, but he had other things to do.

A week later, Rick and Gunter were talking, when Gunter told him that the Elders had decided to allow them to dig some “Emergency Shelters” for them in exchange for some livestock. Their Chickens, Cows, and Pigs had been exceptionally fertile, and they had polts, young weaned calves, and piglets to trade if Rick’s group was interested. Since the only reason they were vegetarians on the Moon was due to the economic and logistical reasons, Rick said Ok. He knew he could find someone in the colony who would be interested in raising livestock. Even the more Liberal members of the Colony would eat eggs and drink milk if it were available. Rick’s scientists and engineers solved the problems of retrofitting 21st Century farm implements to 22nd Century power supplies, and they were busy preparing their fields for planting with the help of the Mennonites, who had no aversion to using power equipment to farm, and had diesel tractors and combines until they ran out of diesel. Rick asked Gunter if it would be OK to retrofit their equipment to run on their power source. He explained how Tesla Power systems worked, and Gunter realized that since they were distributing the power free to everyone like the Sun distributed Solar Energy, the Elders shouldn’t have any problems. He checked, and he was right.

1 month later, all the Mennonite diesel powered equipment was running on Tesla Power. Once they completed the Mennonite’s shelter, they extended an antenna to the surface so the underground fusion reactor could power their equipment using their fusion reactor, so it was on and running in case they needed to get underground with only short notice. The antenna would automatically retract if the blast door was ever closed and locked from the inside, to protect the antenna and reactor from any external threat. Gunter called Rick and said they would deliver the livestock tomorrow, so Rick had them build pens to hold everything. You could have knocked him over with a feather when 8 tractor-trailers showed up the next morning. 6 were loaded with cow-calf pairs, 1 held 6 sows and their piglets, and 1 was full of boxes with hundreds of polts. Rick couldn’t figure why the diesels were so quiet until 1 of the drivers was showing off his new electric drive system and Rick noticed the antenna on the hood. Gunter explained that Rick’s Scientists and Engineers had also replaced the diesel motors in their tractor units with 3 sets of electric motors in the wheels, giving them 6 wheel drive, and 300 horsepower on tap if they needed all of it. The computers they installed sensed the load, and turned electric motors on and off as needed. Due to the wide speed range of the electric motors they used, they were able to take out not only the diesel engine, but the huge transmission. The front driving wheels only received power for braking, and accelerating from a dead stop. As the truck sped up, the front 2 motors in the rear axle set disconnected as well to conserve power. As soon as the load increased, extra motors kicked back in as needed.

Once they got everything unloaded, Rick realized that they would need much more capacity to take care of the livestock, and they quickly built pens at the 10 closest farms and split the load between the 10 closest farms. Each farm got 6 cow-calf pairs, 1 sow with her piglets, and 24 polts. There was enough polts for anyone who wanted to raise chickens to come down and get 2 dozen, so the nearest 50 farms wound up raising chickens for eggs and meat. That created an immediate problem, since they didn't have any chicken feed. Gunter suggested a feed store about 20 miles south of there that had been abandoned for a couple of years. Rick asked Gunter to come along, since he didn't know what chicken feed looked like. They flew the hovercraft, and after about an hour's checking, they located several grain bins full of chicken feed that hadn't spoiled yet, and some spoiled feed that they could add to the pig's mash. Gunter explained pigs weren't picky eaters, and would eat all their kitchen scraps, and spoiled feed. Rick was wondering how to get the grain back to the colony. He wasn't sure the Hovercraft could lift the load, since Gunter said it weighed 30-40 tons including the feed. They walked around the back, and there was a bulk load trailer that could haul the grain in several loads. Rick called the Colony, and several of the tractor-trailers were still sitting there. Rick explained the situation to Gunter, who asked gave Rick a message for one of the drivers. The radio operator on the other end relayed the message, and one of the truckers must have understood, because he dropped his trailer and drove over to the feed company. Gunter said that they had never taken anything because they always had more than they needed, but since this food was just sitting here going to waste, and they had need of it, he asked his trucker to run his rig down there and haul it back to the Colony.

Rick smacked his forehead thinking where would they put the feed. One of the silos was empty, and only weighted a couple of tons empty. They quickly unbolted the silo, picked it up with the hovercraft, and flew it back to the colony. Everyone pitched in and secured the grain silo right as the truck showed up. It wasn't the best job, but it would do for now. They jury rigged a device to unload the trailer and load the silo, then the truck took off for another couple of loads. Rick flew back with Gunter to check out the rest of the stuff there, and Gunter showed him some smaller hoppers for grain that could be loaded from the silo and stored on individual farms. Gunter also told Rick that they needed to think about how to store all that extra produce. The Mennonite women canned all summer and into the fall, but with their power system, there had to be a better way. Rick made a note to himself to ask his Dad how they stored food in the late 21st and early 22nd century. There were several tractor-trailer rigs sitting there, and Rick wondered aloud if they would be worth converting. Gunter's eyes lit up, and he suggested that his people rig the tractor units up for towing, and tow them back to Terra Prime so his Scientists and Engineers could install the new electric drive system. They could then drive their own tractors around scavenging anything they wanted without involving the Mennonites, who took the command "Thou Shalt Not Steal" literally, with no exceptions. He said they'd teach Rick's people how to drive the rigs, then they were done scavenging. They walked inside the office, and Gunter handed Rick several phone books for the immediate area, and said everything they needed was in there. If it was still sitting on someone's lot, he could assume it was abandoned property, and to do with it what he willed. He asked Rick specifically not to give them any stuff they had scavenged, since that would be wrong. Rick asked what if they used the scavenged

gear to save the life of 1 of Gunter's family, since they were running low on medical supplies, and that was the first thing they were going to scavenge. Gunter couldn't answer that one.

Rick called his Dad, who told him that since they moved to Earth, they had a huge surplus of Soybean meal. Rick told his Dad that they had chickens and pigs to feed, so they'd take any surplus grains or soybeans. Rick's Dad asked him how they were going to store all that food they were growing. Rick said he didn't know what he was going to do; most of the infrastructure on Earth was in a state of major disrepair. Rick could hear keys clicking in the background, and his Dad told him that they had thousands of tons of steel available on the moon in billet form, and enough raw materials to make tons more. They could build them a copy of their processing plant and steel mill to convert the billets into sheet steel and then into cans. The entire process was automated to the point that you put food and steel into 1 end, and got canned freeze-dried nitrogen-packed food out the other end. With their fusion reactors, they had energy to burn, so they could do it easily. It would take them a month to build the factories, but they'd ship the excess foodstuffs as soon as they loaded the spaceship. Rick thanked his Dad, called Gunter, and gave him the good news. Gunter asked if they could use his equipment, and Rick agreed in a heartbeat. They could form a Farming Co-op and the factory was big enough to process all their food.

With that out of the way, Rick remembered his promise to Colonel Kirby, checked the Yellow Pages for Medical Supply companies, and found one within maybe 100 miles. It was a big distributor just as they hoped, so they should have a warehouse full of stuff. As soon as they had retrofitted the trucks, they hitched up their largest enclosed trailers, and drove them to the warehouse. Rick flew top cover in a hovercraft, but they didn't see anything even remotely threatening. When they got to the warehouse, the roll-up doors were still locked, so Rick hoped they were full of stuff. Once they got the locks off they discovered the warehouse was packed with stuff. One of their Doctors went with them, and told them what to take. Most medicines and IV fluids had long ago expired, but they had cases and cases of bandages and other products that were still good. Once they had filled up all their trailers, there was still a bunch of stuff left, so they packed it on a pallet, and Rick flew it to Colonel Kirby in his Hovercraft. He called 2 minutes before he landed, and set down a huge pallet of stuff. Colonel Kirby came out and personally thanked Rick, who explained that they couldn't provide much in the way of medicines, since almost everything was expired. Colonel Kirby told him they needed several antibiotics, and gave him a list of the generic and trade names. Rick said he'd do what he could and took off. Once in the air, he called his Dad, who checked with their scientists, who asked Rick to pick up a large quantity of every drug and antibiotic they wanted, and they'd synthesize them on the Moon. Luckily the doctor was still with him on the Hovercraft, and they flew back and picked up a case of everything they needed, and then flew it back to the Colony. Rick hoped they could use the spoiled medicines to synthesize new ones.

2 weeks later the cargo shuttle landed, and it took them 2 days to unload the cargo using forklifts, then another day to load it. Rick couldn't believe the huge pile of bagged soybean meal, there had to be 100 tons of it sitting there, plus 50 tons of various kinds of wheat and

other grains. He knew the cargo shuttle could haul a lot of stuff, and guessed his Dad had stuffed it to the gills. He called Gunter and asked him if he needed any Soybean meal or grains, since they had way more than they'd need since they already had 5,000 acres of Soybeans growing underground. Gunter almost fainted, since that equaled over 200,000 bushels of Soybeans! That would make a LOT of soybean meal.

“Rick, that’s over 200,000 bushels of soybeans, where are you going to store all that?”

Rick’s forehead was getting sore from smacking it so much, then he realized they had the TBMs, and could just store it underground. He told Gunter, who thought it was an excellent idea, since the temperature in their shelter was about 60 degrees Fahrenheit year-round, and it would practically store forever in those conditions, especially in a controlled environment like they were capable of.

Chapter 11

Rick got the TBMs working on digging storage domes, and his Dad was working on completing the canning/freeze-drying factory as quickly as possible. With that out of the way, Rick was looking around for something to do, so he went to check on Keith, and find out how their security was working out.

“Rick, I don’t know how to tell you this, but there’s a bunch of people just to our North on the Canadian border that you’d have to see to believe. Near as I can tell, they’re a colony full of 1960’s Earth Hippies, but they didn’t get it quite right.”

“What are you talking about Keith?”

“It’s really hard to tell from the satellites. I’d like to take a trip up there with half of our hovercraft, and a strong guard force of 50 armed men, just in case.”

“Why do we need such a show of force?”

“It seems they’ve captured some tanks and artillery. I don’t know if they’re in working shape, or if they have any ammo for them. If they do, they could have equivalent firepower to the hovercraft. I’m pretty sure our armor is invulnerable to their tank rounds and any man-portable SAMs they might have.”

“Ok, we’ll do it your way, but I don’t see how some Hippies would be a threat.”

The next day Rick, Keith and Europa flew 6 hovercraft with 8 troopers in each heavily armed with the new rifle and grenade launcher. They set down near the center of the complex right next to an old School Bus painted in psychedelic colored flowers with strange slogans. Rick ran them through the database, and realized they were 1960’s anti-war slogans.

Keith saw them and said “What the heck does “Make Love, Not War” mean, and who’s Jane Fonda?”

Rick shook his head, and landed the hovercraft. They were met by a scraggly looking guy with long unkempt hair and a beard to his waist. He was carrying a huge bong full of a sickly sweet smelling substance that smelled like burning hemp, and was puffing greedily from it.

“Peace Man, where you guys from, and where’d you get the cool wheels?”

“Who are you?”

“Sorry Man, I’m George, and I’m in charge this week.”

“You change leaders each week?”

“Yeah, that’s about as long as we can stand to stay straight enough to talk to anyone! What’s with the Storm Troopers?”

Keith spoke up “We saw your tanks and artillery tubes, and wanted to make sure that if you started anything, we could finish it.”

“Those old relics, they haven’t worked since shortly after the big bang. The only people here that have a clue how to work them is the 3 Amigos, and they’re too busy with the Honeys to give a rip.”

Keith gave his security force the orders to stand down, but keep alert.

“Who are the 3 Amigos?”

They’re these 3 famous old dudes. They’re probably almost 200 years old now.”

“No way, no one can live that long!”

“You need to talk to them about it, that’s all they do all day long is tell stories and chase after the Honeys. Must be nice to be a 200-yr old man in an 18-year old body.”

“This I got to see, can you take me to them?”

They climbed aboard the Hovercraft, and soon landed at “The Res” as they called it. George got out and introduced Ron, Gary and Clarence. Rick introduced himself, and Gary started talking almost immediately. Ron had heard the story before, so he went looking for his favorite Honey. Gary sat there in his easy chair smoking a bong, and related the story about how they survived the Big Bang in his bomb shelter. When they came out, the George Burns Foundation found out about them from a Press release and contacted them, and the next thing they knew, they had 18-year old bodies that never aged. Their wives had died several years later, evidently the process was so expensive that they could only afford to do the 3 Amigos before the Foundation went broke. After the Plague, Gary got the Traveling Bug and decided to head for Iowa. There wasn’t anything left, so they kept heading northeast until they crossed into Canada, found a bunch of 18-year old College Co-eds living in an abandoned campground next to one of the Great Lakes with a huge lodge and stuff. They were an instant hit since they knew how to fix everything thanks to Gary’s database, and their hundred-year knowledge base. Slowly they expanded the commune as people moved in, but as more and more Liberal Canadians moved in, they spent more time smoking some primo weed, and less time doing anything productive. If it weren’t for the AE equipment Gary had salvaged, they’d be living in Tepees and cooking and heating on open fires if they had enough motivation to gather wood.

One of their biggest problems was a chronic case of the munchies, and they were all out of Fritos. When Gary finished, Rick turned to Keith and said “These yo-yo’s aren’t any threat, we’re out of here!” and flew back to the Colony.

Chapter 12

2 days later, Keith came running into Rick's office. "I just got the strangest radio message ever, and I hope you can decipher it."

"Well, what did it say?"

"Moon Doggies, surrender the smokes or else! And it was signed "Gary at the Res" Could it be the same Gary we met two weeks ago? And what the heck are smokes?"

Rick was typing madly, and the Thesaurus of 20th Century English indicated that "smokes" were cigarettes, and further investigation explained that they were a delivery device for a highly addictive drug called Tobacco that you lit and inhaled the burning fumes. Other names for them were Coffin Nails or Marlboros. Rick searched the inventory, and they didn't have anything even close. He asked Keith how they got the message.

"That was the weirdest part, it came through in Morse Code on the 10-meter band. If it weren't for the computer, we could never have received or understood it. How should I reply?"

"Tell that Yo-Yo that we don't have any!"

"Ok Rick."

Keith came back 2 hours later, and handed him another message pad. On it was written "Surrender the Cigs, or we're coming to take them!"

Rick was incensed, now that 200-year old Yo-Yo was threatening him. Didn't he realize he was 18, not Immortal?

"Keith, send this message as written!"

"Sir, that's a little strong, are you sure?"

"I'm tired of wasting my time with these yo-yos, send it as written, and get me their reply as soon as you receive it."

1 hour later, Keith got their reply when they started cranking the turbines on the M-1Abrams tanks, and they suddenly bloomed on the Infrared satellite. He walked to Rick's office and told him they were cranking the motors on their Abrams Main Battle Tanks.

"So what, Dad told me that our Hovercraft could fire 1 40mm round into the top of the turret and destroy it."

“That’s what they told me too. Evidently they need an object lesson.”

“Take a Hovercraft over there, and if they’re still cranking motors or moving the tanks, shoot the lead tank and blow it sky high!”

“That’s a little drastic Rick, how about if I fire next to it?”

“Doubt that will get their attention as much as destroying a tank.”

“It could also piss them off - that could make them attack us.”

“Keith, get real! We’re talking 22nd Century Technology vs late 20th Century Technology - they don’t stand a chance and they need to understand that to prevent them from attacking and killing several colonists. I don’t give a rip about anyone occupying this planet, I just want them to leave us alone, or work with us. Since these yahoos aren’t worth us working with them, and won’t leave us alone, we need to give them an object lesson, and if they don’t get it, we might have to wipe them out. Get used to it, we’ll probably have to wipe out several other groups like that Warlord in New Jersey so that we can live in peace.”

“Ok Boss, if you say so!”

Keith personally flew a Hovercraft over the Commune, and the Tanks were not only running, they were loading them on lowboys. Keith thought “These guys must be total Morons!” He spotted a tank off a little ways by itself, and targeted it from 20,000 feet. He touched the trigger, and a single 40mm round impacted the roof of the turret of the tank. There was a massive explosion, causing the sides of the tank to bulge outward and the turret jumped into the air, flipped over and landed upside down next to the fiercely burning wreck. Next he sent a message: “Gary, this is your last warning. Leave the “moon doggies” alone, or we’ll destroy your entire commune.”

2 minutes later, he received a reply “Don’t shoot, Gary just gets cranky without his cigarettes. Samantha was pulling his leg, and told him that you had several cases, and he believed her.”

Keith replied “We don’t have any, but if we find any in our scavenging trips, we’ll air drop them into the clearing next to your camp.”

“Thanks, The Res, Out!”

Keith flew back to Terra Prime feeling much better.

Chapter 13

When Keith returned, he suggested to Rick that they locate a couple of cases of cigarettes just to keep the natives from getting restless. Rick checked his database, and found out that the last scavenger team had located a whole bunch of liquor and cigarettes at the last warehouse they had visited. Since they weren't interested in either, they ignored it. Rick called the man in charge of that scavenging team, and asked him how many cigarettes they had found. He said there were at least 10 pallets full of cigarettes in the case, with 12 cases per pallet and 60 cartons per case with 10 packs of 20 cigarettes per carton. Rick asked if they could take a hovercraft over to the warehouse and deliver a pallet of cigarettes to the commune up North. Rick wanted to keep the other 9 in reserve for an emergency, like if Gary went on the warpath again. Several hours later, they dropped the cigarettes off at the commune, and received a note from Gary "Moon doggies, thanks for the smokes!"

With that problem solved, Rick asked Keith if there were any more problems. When he replied in the negative, Rick looked disappointed. He decided to talk to Gunter and see how things were going with the Mennonite community. He took his personal hovercraft, and was soon at Gunter's farm. They were in the process of harvesting their fields, so Rick decided to help out. Gunter took the time to teach him how to run the combine, and the rest of the day he harvested the wheat while Gunter and his sons ran the transport wagon to unload the hopper of the combine. At the end of the day, they still had to feed the chickens, milk the cows, and take care of the rest of the livestock. Rick was learning fast, and hoped that the Mennonites had taken the time to teach his people Animal Husbandry. Gunter told him that they had already taken care of that, and everyone in his colony that was raising livestock had been trained by a Mennonite farmer, and they had set up an advisory council of Mennonites to answer any questions they had. Gunter told him that the Canning Factory was a Gift from God, since it freed the womenfolk from the drudgery of canning, and they lost less produce to spoilage. Gunter's wife Helga had even designed the labels for the cans, featuring a classic Mennonite house, and the words "Nature's Best Foods." On the back was a picture of the product, the quantity by weight, and a basic nutritional analysis.

The canning factory was turning out millions of #10 cans of produce each day, and 1/3 were freeze-dried and Nitrogen packed for long-term storage. Each farm had a magnetic tag on their transport wagon, and when it pulled onto the scale, the computer credited them for their deposit of food. They canned some of it, dried some for feed, and freeze-dried the rest for long term storage. Gunter put up several cases of freeze-dried corn in #10 cans in his shelter/root cellar, and filled his grain silo with dried corn to feed the cattle. By the time they were done processing all the food, Gunter's family had 30% more food than they had last year, but they didn't grow any more. He asked Rick, and Rick told him that their spoilage rate was so low since they were processing fresh-picked food the same day it was picked, and usually within hours. Rick said that their Soybean fields had just finished being harvested, and if he wanted any Soybean Meal, TVP or Soybean oil, they had plenty to spare. Gunter knew that the

Soybean meal would make great feed, so he asked Rick how much they could spare. Rick said they had 8 million pounds of Soybean meal in storage, and only needed 4 million pounds to feed all their animals, and to make into TVP. He could give the Mennonites 4 million pounds if they wanted it. Gunter suggested a trade, since the Mennonite animals were still very prolific, and they could give them all their extra polts, weaned calves and piglets in exchange. Rick asked him if he were talking about the quantity they traded last time, and Gunter smiled. Hopefully Rick would be ready this time, and have enough space and feed to take them all. During the last year, they had constructed another 100 farms, each with 100 acres of land, several windmills for water and powered by the Tesla Power system. Each one of those farms could use polts, pigs, and cattle. Rick shook Gunter's hand, and told him that they'd deliver the soybean meal whenever they were ready for it. Gunter said he'd check with the Elders and get back to him.

The next day Gunter told him to go ahead and ship the soybean meal. Rick told him it was already bagged and stacked on pallets, so they could store it in their "root cellar" for now. Gunter laughed, and asked Rick to have them pull a forklift behind one of the trucks so they could unload it quicker. Rick checked, and they had a spare forklift, so he asked the Transportation Supervisor to have them take a forklift with them when they delivered the soybean meal. Later that day they started shipping truckloads of soybean meal. Several days later, they had 4 million pounds of soybean meal in the underground storage caverns that they had bored. They located another forklift and converted it to Tesla Power, and gave it to the Mennonite Community so they could easily move the pallets.

2 days later, Rick received an urgent transmission from his dad. The NEOS telescopes had spotted a huge asteroid headed to Earth. He was hoping they found it soon enough to divert it, but just in case, he had to pack up the entire colony and transfer them back to the moon. Rick asked if he could bring the Mennonite Community with them if they had room. His Dad said he'd have to ask the council, but to start preparations to evacuate everyone including the Mennonites if they wanted to come. Rick signed off, and called an Emergency Meeting of the Advisory Council. When they got together, they were devastated by the news, yet they were relieved that they could return to the Moon for safety, unlike the other inhabitants of the Earth, that reminded Rick, and he quickly flew to Gunter's farm, and explained the situation.

Gunter was afraid to ask the Council about whether they could leave the Earth, possibly permanently, or face their fate here with the whomever was left on the planet. Rick told Gunter he had 24 Hours to let him know, or they'd have to leave without them, since his Dad said they had to be off Earth within a week, since the Asteroid would hit in 10 days if they couldn't divert it. Gunter looked like Rick was crazy, so he took the time to explain that they had the technology to move the asteroid, they just didn't have anything that could travel that far through space fast enough to get to where they needed to install the anti-gravity and ion drive system to push the asteroid out of the way. Gunter asked "Just how big is this Asteroid?"

"My Dad said it's about 5-10 Kilometers, or what they'd call a "Global Killer" in the old

system. If it hits Earth, it will pretty much extinguish all life on the planet. Maybe 50-100 years later, we might be able to come back and repopulate the planet.”

“Why would you guys want to come back?”

“Earth’s still our Home. My Dad was born here, and if it weren’t for his advanced age, and long time in Moon gravity, which is approximately 1/6 Earth, he’d be here too. If you go to the Moon, and the Asteroid hits, you probably won’t be able to return in your’s or your Children’s lifetimes. Maybe your grand kids could help repopulate Earth. We could really use your help, it would mean giving up living on the Earth in your lifetime, but maybe your grand kids could return.”

“What do you mean “We could use your help” You mean on the Moon?”

“No, your community has personal knowledge of how to farm, and do everything we’d need to know how to do to successfully repopulate the Earth. If you wanted to, we could build you a separate colony on the Moon, or you could merge into our existing colonies.”

“Well, if we’re going to be there for 50-100 years, we should really have our own colony, so we could keep our religious and cultural identity intact.”

OK Gunter, I have to get back, but keep me posted - I need to know what you want to do within 24 hours. Also, we can only take enough livestock with us to repopulate the planet later in case the planet is wiped out.”

“You mean like Noah’s Ark?”

“No, you’ll probably need at least a dozen specimens of each, and I’m not even sure Cows and pigs can survive on the moon, but there’s only 1 way to find out. We’ll keep them with us, or with your colony in an Earth-normal artificial gravity.”

“I forgot you could control your gravity. If that’s the case, we could return as soon as it was safe.”

“Exactly - If the Asteroid strikes water, it will kill a whole bunch of people, but it won’t throw up as much dirt, and we might be able to go back sooner. We’ll send an Exploration team to the Earth as soon as the Scientists say it could be OK.”

“I’ll talk to the Council right now if you can wait a while.”

“Want me to go with you and explain things?”

“That would be an excellent idea, let’s go.”

They flew to the Council chambers, and Gunter introduced Rick. The news he told the council was met with incredulous stares until Gunter told them that Rick was originally from a Lunar Colony, and they were trying to repopulate the Earth after the “Big Bang” and their technology was 100 years ahead of Current Earth technology. They spotted a huge asteroid that was 2-4 miles in diameter headed toward Earth, and it was going to hit Earth in 10 days. They had to leave in 7 days to make sure that they got clear of the area before the Meteor hit. The only way the Mennonite Community could survive was if they took Rick up on his offer of sanctuary on the moon. If the Meteor struck water, they might be back in as little as 10 years, but if it hit land, it could be 10-50 years or more before they could return. If they wanted to go, they needed to pack up their essential belongings, a small sample of livestock, and other animals that would be essential like bees to pollinate plants, and be aboard the lunar shuttle in 7 days. The Council argued and debated, but in the end, voted that committing what amounted to Suicide wasn’t necessary to preserve their way, and agreed to go with Rick and his group back to the Moon. Rick thanked them, and told them to start moving stuff to the staging area ASAP, since it would take a while to get everything loaded.

Two days later, the huge transport shuttle landed next to their Explorer shuttle. Rick said a silent thanks to his Dad, since the Transport shuttle would allow them to bring a lot of stuff to the Moon that they otherwise would have to leave behind. Rick ordered they quickly disassemble the food processing plant, take the equipment, and leave the building. He also told them to load the farming equipment including the combines, tractors, and parts. They worked as many hours per day as they physically could, knowing they could sleep on the Shuttles during the long trip to the moon. Finally, with 6 hours to spare on their deadline, They started loading people and their personal effects. Once they were fully loaded, the Explorer took off first, followed by the Transport Shuttle carrying the equipment and livestock. Since they had room to spare, Rick ordered as much of the livestock onto the transport as they had room for. They also loaded all the feed, Soybean meal, and stored food they had. The Transport Shuttle was 10 times the size of the Explorer, and wasn’t carrying people, so they got practically everything they wanted to bring back with them loaded. They left the buildings and stuff they wouldn’t need on the moon. With the anti-gravity systems and ion drive, their departure from Earth was way more sedate than the previous Maglev system, and they were half-way to the Moon when their telescopes spotted the incoming Meteorite. It looked massive through the scope, and they were glad they were headed to the moon. Back on Earth, Gary and the 3 Amigos sounded the alert, but no one believed them. They took shelter in their bunker with a dozen of their honeys, and locked the door behind them.

Chapter 14

The meteorite shattered as it entered Earth's upper atmosphere, and a huge chunk hit the South Atlantic Ocean, barely slowed penetrating hundreds of feet of water, then slammed into the bedrock, sending a shock wave reverberating around the World, and a Skyscraper sized Tsunami crashing into Africa, South America, New Zealand, and Australia, destroying what was left of the island nations, and causing massive damage to the coastlines of the others. A smaller piece about the size of a Volkswagen impacted Lake Superior about 100 miles south of Gary's Commune, sending a 100-foot tall Tsunami racing inland. One of the Stoners that didn't take Gary's advice was an ex-surfer from California who somehow survived everything that happened before, and when he saw the Tsunami yelled "Surf's Up Dudes" and ran to get his surfboard. The wave got there before he could get to his board, and he drowned with the rest of them. Gary must have made his Shelter bombproof and watertight, because it survived the Tsunami and the resultant flooding. Pieces of the Meteor struck various parts of the US, and one landed directly on Gary's old house on Moonraker Road in Palmdale. Good thing he was living in Canada! The biggest piece impacted off the California coast, launching another Mega-Tsunami, and activating the dormant volcanoes in The Ring of Fire. The world shook for several days with waves of earthquakes. Down in their shelter, The Three Amigos laid on the floor of the shelter and covered everyone with mattresses to keep stuff from falling on them. Gary had designed the shelter well, since he remembered all his designs from his Patriot Fiction writing days, and basically built a shelter that was tougher than the old SAC base in Cheyenne Mountain. The entire floor was mounted on springs, the walls were foot thick steel-reinforced concrete and tested for 2 atmospheres of over pressure, positive and negative. The air vents were still closed with heavy pressure-rated valves, so they were watertight. Once the flood waters dissipated, the valves opened again, and replenished his fresh air.

Gary had built the shelter big enough to hold everyone in the Commune, and was stocked for over a year's worth of food for 1500 people (Writing Patriot fiction paid off big time and Gary was a Multi-Millionaire right before the Big Bang.) What he couldn't buy, he "relocated" to the commune, so he had everything he needed for the commune, and when the stupid Stoners didn't heed his warning, he said "Screw Them - more for us!" and locked themselves in. When things stopped shaking 6 months later, on February 2, he ventured out after digging through 20 feet of snow only to discover it was still snowing a blizzard, and the sky was so dark and full of dust that the sun appeared Red. When he turned around, he couldn't see his shadow, so he went back inside to continue repopulating the planet.

Several days later, The Colonists and Mennonites landed on the moon, and once the atmosphere returned to the landing bay, they were escorted to the waiting area for transportation to their colony. Since the gasses produced by the descent engines were toxic, they only built 1 carefully engineered landing bay to land the huge transport shuttles. The Explorer Shuttle looked like a Matchbox car inside the huge hangar. Several of the Mennonites were suffering from Culture Shock from the moment they boarded the huge strange craft, and would require medication and

counseling when they arrived at their colony. As soon as Rick asked his Dad about relocating the Mennonites, he sent several TMBs to dig a new colony next to Delta for the Mennonites. They connected the 2 colonies with a tunnel and a double airlock for safety and security, with each side having control over their lock, with an interlock so they both couldn't be open at the same time. When Rick told Gunter their colony would be ready in another week or two, he was amazed. Rick explained that the tunnels would be dug and the domes built, but it would be up to them to furnish and build the living quarters with help from Delta colony. Since Delta's fields were already planted, Rick offered to have their "farmers" help Gunter's people set up their lunar farms, since they could grow things year round on the moon, and there were a couple of other tricks they needed to learn, like hydroponic systems to water and fertilize the soil. Gunter looked strangely at Rick, so he explained that Lunar soil was basically sterile, but made a perfect hydroponic media, and that the water they used to irrigate their fields was a nutrient solution designed for each type of plant. Gunter kind of understood, and Rick said that the Delta Colony farmers could show him how it worked easier than he could explain it.

Several Colonies had been monitoring their terrestrial telescopes, and recorded the damage to the Earth. It wasn't as bad as they had feared, but it was bad enough. The Earth's atmosphere was full of a thick cloud of dust that didn't allow much of the sun's energy to penetrate, and the planet was slowly dying before their eyes. When Rick heard about it, he was glad that they'd taken the time to gather seeds and seedlings of all important Earth flora and fauna just in case something like this would happen. If things ever returned to normal, they could plant the seeds and seedlings, and slowly rebuild the environment of the Earth. The transport ship had indeed been Noah's Ark, with several members of each major species of animal and plant stored and cataloged. One lunar dome would be a dedicated Earth preserve for all the plants and animals they had acquired. They were worried that the predators would eat the rest of the animals before they established a safe level of population. Gunter and Rick were still trying to figure that one out, and hoped the Lunar Scientists could figure it out in time. They didn't have time to save every species in the world, or even in North America, so what they did was capture as many necessary species in their immediate vicinity to hopefully form a stable biosphere, even if it lacked genetic diversity. They just didn't have the time or the ability to capture every species of plant and animal that survived after the big bang. Rick hoped some animals survived on Earth in isolated areas, so they could repopulate their areas.

Once they learned the new construction techniques and new materials, the Mennonite Craftsmen proved just as skilled at making furniture out of hemp-based plastics as they were out of wood. They quickly furnished their houses, and the Mennonites adjusted to the "Modern conveniences", but they weren't too happy about the shower and toilet facilities until Rick explained that having them co-located with the gardens was essential to their hydroponic system, which recycled all the nutrients and water back into the gardens, since they didn't have water or nutrients to waste. When Rick told him that all bodies were cremated and their ashes added to the hydroponic system, he almost had a revolt on his hands. Finally a Lunar Clergyman met with their Elders, who quoted scripture verbatim ranging from Genesis to Daniel, showing the significance of dust and ashes, and the creation of Man from the dust of the

Earth. He explained that they didn't have the space or facilities to perform a whole body burial, and all Cremation did was accelerate the natural process of decomposition. After much heated debate, they reluctantly agreed to make an exception while they were on the Moon, but as soon as they got back to Earth, they were to practice whole body burials again.

The Mennonite farmers learned quickly, and were soon producing 3 times as much food as they had before, basically because instead of 1 or maybe 2 crops, they were growing year round with natural and artificial sunlight in a tightly controlled environment set at the optimum levels for maximum food production. They had to build another canning facility to handle the extra volume. They were producing so much produce that they had enough excess to expand their herds to other colonies that had near-earth gravity. They had tunneled and fashioned several extra domes just to raise cattle, and grew grasses and alfalfa to feed the cattle with. The pigs ate some of the scraps, and their wastes were fed into the biodigesters. They turned out to be efficient biodigesters themselves, converting scraps into bio-waste that the system could easily break down into it's component nutrients and producing edible meat.

The cattle weren't as efficient, but they appreciated the milk to make dairy products for the first time in almost 100 years, and Commander Nelson got his first steak in over 50 years later that year when they slaughtered their first steer. He said it was even better than he remembered. Nothing was wasted on the cow, and anything that wasn't eaten or used for feed or other products was ground up and feed into the biodigesters. Since there were no diseased animals being shipped to the moon, they were safe recycling all the parts of the animal. The Chickens were the biggest hit, since they were mostly egg layers, and it had been just as long since they'd seen a real egg or a steak from a cow. Their manure was recycled as well, and someone had a bright idea and brought a huge quantity of earthworms with them from Earth, and started growing them in worm boxes. They were fed the chicken droppings and other debris, and their dried dead bodies were mixed into their feed and fed back to the chickens as a source of protein.

Some of the chickens were prolific egg layers, and they had just enough roosters to maintain the population, and slightly expand the flock. As the flocks grew, they either slaughtered the older unproductive egg laying hens, or the polts when they were at a good weight. Meat was starting to become a part of the lunar diet again, now that they had so much excess food production since they could grow corn and wheat in the near-earth gravity domes of Delta and Epsilon colonies. Commander Rick Nelson got a chance to meet with the Mennonite leadership when they traveled to Lunar Prime for a State function. He thanked them for the rest of the Lunar Colonies, and assured them they would be returned to Earth as soon as it was safe to do so. Gunter said "It's you and your son that we have to thank for our lives. If you hadn't befriended us, and brought us to this sanctuary, we would have all died, and our culture with it. We're grateful that you've given us not only sanctuary, but a separate colony so we could maintain our religious and cultural identity. Even if we never were able to return to Earth, we'd still be grateful."

"I've got some good news for you. The asteroid was smaller than we estimated, and didn't do

as much damage as we feared. The earth is covered by a dust cloud, so we can't see the surface, but the good news is that our radio telescopes have been focusing radar beams on the Earth, and the reflected images indicate that the surface is still intact, so we might be able to go back somewhere in the next 10-50 years. In the meantime, make yourselves home here, and if there's anything you need, just ask."

The Elders were pleased at this news, since they really didn't want to live among the English for any longer than they had to, even if they had their own colony, they were still asked to do stuff that they normally wouldn't or shouldn't do in order to survive. They were a little too dependent on the rest of the lunar colonies for basic supplies, since there were no natural resources like they were used to on Earth. While the plastic furniture looked like wood, it didn't feel and smell like wood, and they had to learn to cook their food in a modern electric kitchen, since they didn't have wood stoves or anything else they were used to. They had showers instead of a normal bath, and their flush toilets took some getting used to. Even the very sky was an illusion created by a light blue dye sprayed onto the roof of the dome, and there were no stars at night. Gunter and Helga were the most comfortable, but some of the older families were having problems adjusting to the new environment, and some needed medical treatment for depression and insomnia.

5 years later, they launched the first exploratory probe of the Earth. They came back telling Rick and his Dad that there was still 10-20 feet of snow covering most of North America, and the Ice Caps had expanded past their original boundaries into North-central Canada and Alaska, and parts of the Great Lakes were frozen most of the year. They needed to wait to see if this was a permanent Ice Age, or if the planet would recover as the dust settled. Gary was now very glad that he had enough supplies to last 1500 people a year, because it now looked like it would need to last his 15 people for at least 10 years, or until the snow melted enough to start planting crops. Gary had bought a huge supply of Non-hybrid seeds, and stored them in the shelter along with a huge supply of Ammonium Nitrate fertilizer. The 3 Amigos were the only ones to realize that it was the same type of high-nitrate fertilizer that you could make a fairly potent explosive out of by adding diesel fuel or fuel oil to it in the right proportions. Even though their Abrams tanks and artillery were toast, they still had their Springfield Armory M-25's with the top-line Springfield scopes, and almost a million rounds of Black Hills 7.62 Match ammo for them. They also had over 100 M - 4 / M - 203 combinations with 100,000 40mm grenades including HE, HEDP, and Cannister rounds. They weren't as well equipped as they once were, but at least they still had some self-defense weapons, including several hundred Claymore mines, command detonated Bouncing Betty type mines, and several dozen anti-tank mines. Gary was grateful that Rick had sent the case of cigarettes to him before the Big One hit, but wished he had shipped him some more cases, because at this rate he'd run out of smokes before his 300th birthday!

Gary and the 3 Amigos realized that they might be the only people on Earth, but when their "wives" started having kids, they realized something else. Their kids healed quicker than any kids they remembered, and never got sick, not even a cold. Gary was frustrated since the

Internet was down, and he couldn't find out what those doctors really did to them. The only thing he had found years ago was a monogram in the Journal of Applied Biogenetics written by one of the researchers hired by the George Burns Foundation. Evidently George spent all his money researching how to live forever, and died just years before they developed the technology. His will stipulated that the Trust spend his funds when they perfected the technology to select 2 or 3 men over 60 years old, and give them new bodies. According to the monogram, the procedure involved cloning, and genetic manipulation so the new cloned body would self-repair every week, and barring total loss of blood volume or fatal trauma to the brain, they were for all intents and purposes immortal. Gary was turned on to pot by a couple of the stoners when they got tired of him whining and complaining that he didn't have any smokes and told him "Here, smoke this!" One of them handed him a bong, and he took that first fateful hit. He was amazed when later he didn't develop a "smoker's cough" from smoking weed, and later when he accidentally cut himself, he was afraid that his diabetes would prevent his healing, but a week later the injury healed without a scar. He checked his feet, and they were the feet of an 18-year old. He'd never understood what really happened to him until that point, he was just grateful for the 18-year old body, and the knowledge of a much older man. Now instead of just looking, he could make love all night to women he used to fantasize about. Most 18-year olds were inexperienced lovers, but he had the best of both worlds, and soon was the most popular man on campus, at least until Ron and Clarence got into the act; then he had to share.

Years later, they built their "commune" called The Res, and built their shelter. Most of the people who gravitated to the Res were people who Gary would normally not have associated with, but he was too busy with his harem of 18-20 year old "Honeys" to care much about anything. When the stoners got him started on marijuana, he cared even less. When Rick delivered the cigarettes, Gary chucked the bong and lit a Marlboro 100 in the hard box for the first time in years. He sat there and just enjoyed it. Being a confirmed smoker and pack rat, he bought a case of butane cigarette lighters and stored them in case he ever found some cigarettes. Less than a week later, he saw a strange fast moving star one night where no star should be, and guessed it could be an incoming meteorite, and sounded the alarm. When the Stoners laughed at him, he gathered his "honeys", told Ron and Clarence to get their girlfriends, and got them into the shelter with minutes to spare. He had seen "Deep Impact" so he knew what to expect, and had everyone lie on the floor in a fetal position, with their mouths open and their hands over their heads, then he laid a mattress over everyone as an additional protection against flying and falling debris, then he flipped a switch that disconnected the shelter from the outside and closed the air inlets. With only 15 people in the shelter designed for 1500, they had more than enough air for several days. He was afraid if the meteorite struck one of the Great Lakes, the resulting Tsunami would flood the shelter, so he designed it to be waterproof up to 100 feet under water, knowing the deepest the flood waters could get was maybe 20 feet. The valves he had installed in the air inlet vents could be closed by a solenoid in a fraction of a second, which was exactly what happened when he threw the "panic switch" disconnecting the shelter from the outside world, and closing the valves. Minutes later, a huge shock wave picked everyone off the floor and rattled them like dice, despite the sprung floor. 5 minutes later, there was a horrible

roaring sound like a thousand freight trains, then silence as the wave washed over them, blotting out any sounds. Gary was praying about as feverently as he had in his 200-year life.

Chapter 15

30 years later, the scientists told Rick they had perfected gene therapy and animal cloning, and just in time, since the cattle herds were suffering the effects of in-breeding. They located their best cow and bull, and took a DNA sample from each of them, manipulated and perfected their gene pairs, and cloned 20 pairs of perfect cattle. Once they were sure that the clones were in fact perfect, they started cloning the other animals, starting with the chickens and pigs. Once they had enough genetically perfect animals to sustain a population, they neutered the remaining animals or slaughtered them to prevent their inter-breeding and polluting the gene pool. Next they started cloning the thousands of animals they had captured. Just as they were finishing the process, the latest Explorer Shuttle said that the Earth was habitable again, and they could go down. The Mennonites were overjoyed, and threw themselves into tearing down and packing everything they wanted to take back to Earth, and loading it aboard the transport shuttles. Rick had learned from his last trip to Earth, and built several transport shuttles, so they could bring more stuff, including all the equipment they'd need on Earth to colonize it. He realized that last time they'd been naive, and this time they'd be loaded for bear! They built a large fleet of armed transports capable of flying across oceans, and hauling hundreds of armed hovercraft, ammo and personnel, along with enough supplies to fight a war if necessary. This time they took half of the people on the Lunar Colony with them, since they all wanted to go, and they were able to acclimate them to the 6-times greater gravity much quicker now that they knew how to do it right. Even the Research Center was depopulated by half when the Scientists who had expertise in specialties more useful on the Earth decided to join the colonists on Earth. The head of the Research Center made sure that there was still 1 expert in each field left on the Moon just in case. All of the Astronomers, Astrophysicists, and several other disciplines that weren't needed on Earth, and could do better research with the tools in the Research Center decided to stay on the Moon, and wished the Biologists and other Earth Scientists Good Luck and Godspeed. When one of the Senior Earth scientists pointed out that they could still talk via Videophone, that ended the maudlin goodbyes.

2 weeks later, the fleet was orbiting the Earth, assessing the damages, when their ground penetrating radar located their artificial caverns right where they suspected they were. The sensors didn't indicate any signs of life, so Rick and Gunter, along with a security force, took a Hovercraft to the surface to investigate. The previous Ice Age had wiped out any above-ground signs of habitation, and below ground, they were met by the grisly scene of skeletons piled up against the blast doors protecting the underground airlocks. Since they had always built their caverns on the Moon with outer blast doors capable of standing up to a small nuclear explosion, they just continued to do so on Earth, not realizing that it would prevent any interlopers from taking over the caverns. Once they got the skeletons cleaned up they went inside, and except for the fields growing fallow, the air was fit to breath, and the fusion reactor was still running. Rick called the fleet and gave them the good news. Rick decided they had better check out Gunter's caverns as well, just to be neighborly, and to save the Mennonites the grisly task of clearing out the skeletons. When they got to the Mennonite colony, Rick found a disturbing

note attached to the door mingled among a huge pile of bodies.

Damn you for locking the door!

Col. Kirby US ARMY (ret.)

Rick guessed correctly that col. Kirby's renegades had made it to their shelter, only to find the door locked and impenetrable. Rick didn't feel sorry for them in the least. They were just about the lowest scum of the earth, and they'd been preying on the weaker survivors instead of helping them. Next they flew to the Amish community, and were met by a scene of desolation. Not one brick of their houses was left standing, and there was no sign of the Amish. Gunter hoped they had survived, but Rick held no such illusions. They had refused their help, and had suffered the consequences when the meteorite spawned a Tsunami and a 30-year Ice Age that destroyed anything above ground from the Arctic Circle to the Mason-Dixon line, or slightly south in some cases. Remembering Gary's commune, they flew up to Canada next, and found a much smaller commune based on the 3 Amigos, 12 50 year-old women, 30 20 year-old women, most of whom were pregnant and had other kids roaming around, and a bunch of kids ranging from toddlers to teens. The older kids were helping with the chores, the young pregnant women were doing light house work or in bed resting depending on the stage of their pregnancy, and a couple of the older women were babysitting the older infants and toddlers. They had a thriving farm going since the tsunami washed up a fresh load of topsoil, and once the snow and ice retreated, they were able to start planting. They had acres and acres of greenhouses made from rolls of clear plastic and PVC tubing Gary had stored in the shelter just in case. Rick won Gary's favor immediately when he handed him a huge bag of Tobacco seeds. He told Gary that the warehouse that stored his cigarettes was probably destroyed, and if he felt the urge to smoke, he would have to grow and dry his own tobacco.

"Glad you showed up, I was down to a couple of smokes per day, and the Honeys were getting tired of how grouchy I was getting. Any idea what's going on in the rest of North America?"

"We didn't see any signs of life in our surveys, and the Ice came as far south as Tennessee. Florida and the eastern seaboard was probably flooded by the tsunami, and I can imagine what happened to the west coast. Odds are, we're the only people left in North America."

"Well that's great by me. You guys planning on going back to Pennsylvania where you were?"

"How'd you know we were in Pennsylvania?"

"I have my ways!"

They shook hands, and agreed to a live and let live arrangement, then Rick handed Gary a communicator, and told him if they needed anything that communicator could contact him anywhere on the Earth. Gary was amazed, it was smaller than the communicators he'd seen in

Star Trek. He had a wild idea, and flipped it open just like he'd seen Captain Kirk do it on Star Trek. It opened, and sure enough made the same noise.

Rick looked at him and said "How'd you know to do that?"

"The more things change, the more they remain the same. I saw it on a 1960's TV show called Star Trek, and they had communicators just like this. I don't suppose you developed Phaser pistols?"

Rick was typing away on his wrist console, and the record came up. It seemed Gene Roddenberry wrote a screenplay that quickly became a cult classic, and lived on in re-runs way beyond the original 2- year TV run, spawning several movies, new TV shows, and a bunch of cult followers of the Show called Trekkies. When he found the communicator, it did look exactly like theirs, and functioned almost the same way, even down to the silly-sounding beep tones when you opened it. He wondered if someone at the Research Center was a closet Trekkie, or if it was a remarkable coincidence. He looked up the Phasers, and had to admit they hadn't considered energy weapons yet, but he'd forward the idea to the Research Center in case the Martians invaded.

Gary's eyes got the size of dinner plates, then he realized that Rick was pulling his leg.

"Very funny Moon Doggie!"

"Why do you keep calling me Moon Doggie?"

"Just something I remembered - it sounds funny."

"Ok Tobacco Breath, whatever you say!"

They both started laughing, then Rick said he had to get back to the space ship, they had a lot of work to do. Gary thanked him for the seeds again, and then Rick climbed into his hovercraft and hurried home to the spaceship.

He had the ship holding the Mennonites set down next to their caverns, and the ones carrying the Lunar colonists set down next to the old Lunar colony. Rick realized that they needed more land, and decided to send scout Hovercraft teams out to check out the surrounding land for suitable farming areas.

Chapter 16

The hovercraft teams located thousands of acres of suitable land, and they started building 2,000 acre homesteads every couple of miles in a grid pattern. They set up fusion reactors powering Tesla transmission equipment to blanket the area with enough energy to run everything, and since they knew what they were doing this time, they soon had the houses, barns, and outbuildings built. Seems they got lucky, and once the snow and ice melted, the dormant seeds germinated and started growing trees and plants again, just like the last ice age. Once they released the bees and other beneficial insects, they quickly built hives and started pollinating plants. Their genetically perfect cows, pigs, and chickens started reproducing as soon as they were moved to their new homes, like they had never left. The Mennonites had thoughtfully included a small sample of draft horses and they too went right back to what they were doing when they were collected and transported to the Moon. They quickly prepared the ground for planting, and planted all their crops. They rehabilitated the underground caverns too, and planted them with crops that needed a longer growing season. They reassembled the canning plant, and when the first harvest came in, they were all ready to can, dry and freeze-dry all the produce that came in. Once they were established, they put up a constellation of various satellites, including radar and visual/IR observation satellites. They were looking for other pockets of civilization, and found precious few. There were some small groups of hunter/gatherers in Eastern Europe and Siberia, and some Aboriginal groups in Australia and New Zealand that their Cultural Anthropologists suggested to leave alone, and only observe from space, or via hovercraft at an altitude high enough to prevent their observation. They had some theories they wanted to check out, and told the Council that if they left the natives alone, they could study them and gain invaluable information about hunter-gatherer societies.

Rick Jr. was now in his 80's, and his son Matt was being groomed to lead the colony. For some reason, Rick called his son "Moon Doggie" every now and then, but never explained it. Finally they decided to see how Gary was doing. When they got there, the Honey's were ready to revolt. Gary took Rick aside and suggested taking several of the younger honeys back with him and finding them husbands, since they really didn't want to have sex with their grand-daughters. Rick looked at him funny, and Gary explained that when they went into the shelter, they were the only males in the shelter, with about 12 women. Well they started repopulating the planet while they were in the shelter, and when they came out, there weren't any other men around, and their daughters were getting to the age where they wanted kids. They were careful not to have sex with their daughters, which was easy to prevent, since they knew who had gotten whom pregnant. By the time the grand-daughters were old enough, the only partners they would have had would have been either the 3 amigos, or their sons. When Rick and his crew showed up, they thought that was the solution to their problem, but they never stuck around long enough to get to know each other. Rick said they had some single men of marriageable age, but they had a hard and fast rule that marriage was for life, and adultery was punishable by death. It was a law left over from their days as a lunar colony, and they saw no reason to change it. If the women wanted to marry their men, they had to be sure, because there was no

going back in their society. If they chose to leave their husbands for any reason, they would have to move back to the Res with the 3 Amigos and never return.

Gary talked it over with the women, and half of them, the younger ones without a husband, wanted to take the first shuttle over to the Terran colony and find a husband. Rick said he didn't have enough room to transport them all, but he would send a shuttle to take them and their possessions to the colony. If they didn't find a husband, they were free to return. He called the ship and arranged for 2 hovercraft to shuttle the women to the colony. When they got there, a huge crowd of Bachelors was waiting for them. Some of the men already had girlfriends or fiancées, so they stayed away, but that left a lot of men between 18-30 for the women to pick over. After a couple of weeks, most found husbands and settled down to farm life. The few that didn't were offered a choice to live with them and hopefully find husbands later, or go back to the Res. None of the women chose to go back.

Over the next hundred years, the settlements continued to spread out over the US, and the lunar colonies continued to grow and prosper. Every 25 years or so, another group of settlers would leave the moon and settle another area of the planet. The technology kept advancing, and finally they had the means of traveling at a high enough velocity to consider colonizing Mars and Venus, and some of Jupiter's moons. It was a struggle, and some of the colonies failed, but eventually Mankind colonized all the inner planets except Mercury, which was just too blasted hot, even hundreds of feet under ground.

On his 500th Birthday, Gary decided he had enough, and killed himself, only to come back to life 1 week later.

The End