

Transplantation

4/25/2013

Today is my 120th birthday that falls on June 18, 2056. This date coincides with the grand finale of the first stage of a monumental space program. In 2030, the World Space Agency came together as a consolidated bureau to coordinate all space exploration programs on the planet and their combined efforts resulted in this ambitious program to transplant carboniferous life throughout the Milky Way galaxy.

This milestone in space science caused me to reflect upon a sighting of an Unidentified Flying Object that my wife and I had seen one afternoon in 1962. At that time, while getting gas at a Texaco gas station, the station attendant pointed to a shinny object in the clear blue sky. My wife and I looked up to see a perfectly round silver disk in the Northeast. Its uniform luster and diminutive size gave the impression that it was located high in the stratosphere. This strange object remained stationary for at least 10-15 seconds, then seemed to come toward us and then quickly reverse course and disappear over the horizon.

In the 1960s, sightings of Unidentified Flying Objects (UFOs) were common and these tales of 'Flying Saucer' sightings sparked intense debate about their true nature. Some speculated that earth was being scrutinized by aliens who might have nefarious intentions to invade or colonize earth. The mass hysteria that accompanied Orson Welles' radio drama, *War of the Worlds* in which listeners were lead to believe that Martians were invading earth exemplified this real or imagined fear of the unknown.

In the years after 1962, my wife Ann and I often told friends of our experience but we made no report to the Air Force for inclusion in their Project Blue Book study of UFOs. In the late 1960s, the Project Blue Book was terminated after 17 years with a final report concluding that the preponderance of UFO sightings could be explained by natural and deceptive phenomena. Moreover, aliens represented no security threat to our nation.

Multiple sources pooh-poohed claims by individuals that they had been abducted by aliens and taken aboard UFOs where they were subjected to medical examination prior to release, as well as the rumors that eight or nine Marians who died in a crash of a UFO were held in the deep freeze at Wright Patterson Air Force Base.

During the decades, after our sighting of a possible UFO, scientists scanned the heavens with advanced instruments designed to detect evidence of extraterrestrial life. Massive arrays of radio telescopes and a variety of earth based and orbiting scanners failed to produce any evidence of intelligent life elsewhere in the universe. Granted, the background 'noise' of space due to pulsars, supernovas, electromagnetic forces, solar winds and cosmic rays made the detection of alien voices extremely challenging. And if life existed elsewhere, it would take thousand, if not millions, of years for transmissions to reach earth. Although frustrated, astronomers and physicists were not deterred from the belief that life existed elsewhere in the universe. After all, there are a trillion or more galaxies like the Milky Way with billions of solar systems of varying ages. Certainly, environmental conditions must exist somewhere out there to generate life forms that had organized genetic units capable of metabolism, reproduction and evolution.

Although the detection of extraterrestrial life was elusive, the early 21st Century produced vastly improved instrumentation to enhance our understanding of our home address, the Milky Way. The Milky Way is a spiral galaxy spanning 100 thousand light years end-to-end and containing billions of stars, large nebulae, massive black holes and exploding

supernovas actively producing new stars of every type. The disciplines of astronomy, astrophysics and chemistry converged to clarify the architecture and composition of stars with their planetary bodies within a radius of 1000 light years from earth.

From a practical standpoint, it was postulated by scientists that a distance of 150 light years from earth represented the upper limit for space exploration with unmanned probes and spacecrafts. Within this distance, astronomers identified more than 10,000 stars with orbiting 'families' of exoplanets. Approximately a quarter of these families had orbiting planets similar to earth in terms of mass, orbital size and axis rotation. Additionally, one-half had one or more orbiting moons that might be capable of supporting life.

Starting in 2030, the focus of the World Space Agency was on the 1500 or more exoplanets within 50 light years of earth with features most compatible with carboniferous life. The Agency developed a grading system that included size, gravitational pull, orbital symmetry, electromagnetic fields, radiation levels, surface temperatures, liquid water and the presence of Carbon Dioxide. Other elements and molecules were also considered including methane gas, sodium, chloride, sulfur, nitrogen, calcium and phosphorus. Advanced technologies enabled precise classification and a space map of suitable targets for space exploration or even colonization.

While astronomers and astrophysicists were enjoying success in identifying and studying celestial bodies in the Milky Way, nuclear physicists were having their difficulties in filling in the blanks and unknowns within the Standard Model of elemental processes. The earlier promise of having definitively identified the Higgs Boson or 'God Particle' to fulfill the Standard Model had faded as a host of other subatomic particles emerged. The physicists had to add to their stable of Fermions and Bosons many types of neutrinos and anti-matter particles. Moreover, little light had been shed on the ubiquitous 'Dark Matter' and 'Dark Energy' that was postulated to made up 80 percent of all matter in the universe. With so many

unknowns, the science community continued to conjecture about and attempt to prove string theory, super-symmetry, multi-verses, multi-dimensional space and time and why the quantity of matter in the universe exceeded that of anti-matter.

During the formative years of The World Space Agency, China placed a colony of astronauts on the moon to explore commercial opportunities. Unfortunately, the mission was a total failure due to logistical problems, several space disasters and unsustainable costs. Likewise, the United States placed an orbiting space station on Ceres, a large asteroid. Although a remarkable achievement, NASA terminated the mission for similar reasons.

Private enterprise and private equity also entered the space race with a Space Arc Project. This produced a huge dirigible-like vehicle that fully inflated after launch to a size that accommodated a complete self-sustaining ecosphere with communes of humans. Due to huge cost overruns and design problems, the project never got off the ground and no 'space babies' saw the light of day.

The boldest manned expedition was to Mars in 2033. From a scientific and technical standpoint, the mission succeeded, but failed to provide evidence of previous life, mining opportunities or a climate compatible with human existence. Consequently, Mars was ruled out as an alternative to earth for the exportation of life should the sun began to expand.

The tangible spin offs from the research and development attendant to space exploration related to new technological advancements. Scientists perfected both hot and cold fusion nuclear reactors that were compact, essentially maintenance free and could supply an almost unlimited fuel source for extended space travel. A quantum leap in robotics had occurred to perfect an army of remarkable intelligent machines with boundless physical and mental capabilities. Nano-technology had come of age with new iterations of switches and transistors that manipulated subatomic particles for quantum computing. And the science of chemistry added new

elements to the periodic table and produced molecules and molecular structures with dazzling properties.

The most important intangible benefit from these costly expeditions into space was the realization that living and breathing humans were neither physiologically nor mentally tough enough to tolerate the rigors of prolonged space travel and exploration. Even the yearlong Mars expedition infected the astronauts with intractable bone marrow failure and anemia due to radiation plus mental disorders causing severe cognitive impairment. This disease complex became known as the Deep Space Syndrome (DSS).

Many studies tried to solve the riddle of the Deep Space Syndrome that precluded lengthy human space travel. Mammalian research showed that hypothermia and hibernation could achieve a dormant state for several years with full recovery, but longer periods produced irreversible asthenia and CNS degeneration. Various forms of cryopreservation did not solve the problem either because of the destructive formation of tiny intracellular ice crystals that compromised organ function. Thus, to transport live humans on a space journey to a planet in another solar system that would take a minimum of 20 years seemed impossible. In 2036, acting on a consensus within the scientific community, the World Space Agency declared that deep space exploration with the possibility of transplanting life would need to be carried out using intelligent inanimate machines and primitive life forms.

During these times, molecular biologists continued to make huge advances in understanding both simple and complex cellular organisms. Creating an intricate map of the genes and chromosomes became a routine laboratory procedure. As the constellation of individual genetic segments emerged, the science permitted the splicing of DNA into 'biobricks' or very short segments of DNA that could be methodically strung together to create boutique species or modify existing ones. Eugenetics had come of age. This produced the ethical dilemma of the century as the pre-implanted 16 cell human embryo could be evaluated for defective

genes and modified or discarded. Consequently, the desire of every parent to have a perfect child was within reach.

Cellular biologists also made significant advances in unraveling the mysteries of epigenetics which is the science of how the DNA in the cell nucleus gives instructions to the RNA in the cell to carry out cellular activities. Moreover, epigenetic research uncovered many unstable segments of DNA and RNA that, when introduced into cells, could greatly increase the rate of gene mutations.

The result of this bioscience was cures and not just treatments for most major chronic diseases. However, mastery of genomics and the use of stem cells did not expand the limits of average life expectancy beyond 125 years. This barrier to immortality related to the slow deterioration of all cytoplasmic organelles and the fact that cell death usually occurred spontaneously after 50 cell divisions. Metaphorically, the body acted like an automobile where critical parts could be replaced but the rest of the chassis continued to rust.

Biologic science revealed even greater complexity of simple cells than had been previously thought. Indeed, cellular biologists remained frustrated by their inability to create a roadmap for the development of even the most primitive single cell organism or archeae under ideal conditions in the laboratory. As a result, most in the scientific community came to the conclusion that the spontaneous development of carbon based cellular life that arose from the primordial soup on earth a billion years ago probably did not exist elsewhere in the Universe.

In 2036, to address this conundrum, fifteen-hundred of the World's leading scientists were invited to contribute their scientific works to a virtual summit and to compile a compendium of all scientific papers concerning the possibilities of alien life. The primary purpose was to answer the question, "Are we alone in the Universe." The month long conference produced a consensus position paper that stated "In all probabilities, intelligent life on earth is unique and does not exist in other locations in

the Milky Way Galaxy.....humanity is doomed to extinction unless it establishes settlements elsewhere in the universe where some star system might offer environments compatible with human existence.”

This communiqué created a firestorm of controversy that prompted the World Space Agency to reexamine its mission. Leading scientists discussed whether it might be possible to seed some form of carboniferous life into other solar systems in the Milky Way. If transplanting any life form were successful, it might trigger a Darwinian evolutionary process, the end point of which might be intelligent life or maybe even humanoid creatures.

Decades of failure in finding life, establishing settlements and mining resources in our solar system had produced a very demoralized and frustrated team of scientists within the World Space Agency. Thus, the hint of a new mission to spread life across the Milky Way aroused new hope within the Agency that had chronic funding problems and a spate of underemployed space scientists. The World Space Agency quickly accepted the gauntlet, and its governing body coined a name for an ambitious program to transplant life *The Last Frontier Project* (LFP). The Agency formed a Super Committee to do a feasibility study and design the LFP project.

Many of the 15 billion inhabitants of earth raised objections concerning this frothy frolic into space, the benefits from which would not accrue to their offspring or, most likely, any future generation of humans. They contended that the money could be better spent at home solving earthly problems. What experiment can justifiably span many hundreds of years with no immediate, or for that matter, intermediate term returns on the investment? Conversely, the unemployment rate among young gifted engineers, space administrators, industrialists and robots was extremely high and there were no World Wars, new stimulus packages or economic bubbles to pull the World out of the global funk that had lasted close to half a century. Urgently, the World's economy needed a 'shot in the arm' to get moving again and this project was projected to employ over 10 million of

the best and brightest for at least ten years. Moreover, with interest rates near zero, the World Space Agency with guarantees from The World Bank could issue unlimited quantities of AAA rated bonds to finance the project.

Intellectually and spiritually, The Last Frontiers Project (LFP) resonated as a unifying challenge and all political parties and nations hardily endorsed the endeavor referring to it as a milestone in human ingenuity and achievement. The religious creationists were less enthusiastic because it challenged the natural order of things and the book of Genesis.

The Super Committee's preliminary report indicated that the project would require two distinct steps to achieve its objectives. The first step would consist of exporting lower life forms to a distant planet to establish an ecosystem that could support a human colony. The second step was the actual insertion of humanoids into the ecosystem. The revolutionary technology to permit this second step was on the drawing boards, but some feasibility questions remained.

Research dollars poured into the LFP project from all quarters and this compounded the rate of scientific discovery that had already produced a remarkable collection of breakthroughs.

First, miniaturization had made unmanned space vehicles extraordinarily small and energy efficient. Quantum computers that employed entanglement technology were thin as tissue paper and could store limitless amounts of information while performing multiple calculations simultaneously.

The carbon atom had become the nexus for nano-science research producing materials that were flexible, malleable, versatile and excellent conductors. Massed produced carbon 'bucky balls' and 'graphene wafers' were 40 times harder than steel and a thousand times tougher than diamond. Moreover, carbon materials are excellent conductors of heat and stable when subjected to electromagnetic forces.

Massive investment in robotics had produced impressive machines with awesome capabilities and computing power. The central processors on thumb nail-sized robots could easily outperform the human brain and robotic operating systems programmed the machines to be incorruptible and capable of independent reasoning and teamwork. Moreover, as inanimate machines without feelings or motivation, the 'science fiction' concerns of the public that robots might rebel, replicate and take over the world was pure fantasy.

For an organism to remain viable for hundreds, if not thousands, of years to survive a journey to a distant planet was an extraordinary challenge. Moreover, after arrival, it had to have extreme adaptability to adjust to the new environmental conditions.

An even greater challenge for the bio-scientists was to create a complete ecosystem for the organisms to survive, multiply and evolve into higher life forms. They realized that to create a basic ecosystem would require two types of eukaryotic cells or mature cells with membranes. The first cell type would be green algae that convert light energy and carbon dioxide into organic compounds while producing oxygen. The second would be a single cell animal that metabolically consumed oxygen and produced carbon dioxide.

In selecting a form of green algae and single cell animal, certain criteria had to be met. First, each organism had to have a spore form or vegetative state that could remain dormant for hundreds or thousands of years, withstand a broad range of temperature changes and unstable chemical environments. Many natural and 'manufactured' organisms met these criteria. Moreover, additional DNA and RNA phage particles would be inserted into some cells to increase their adaptation to a wider range of conditions and speed up evolutionary change.

To enhance the chances for transplantation to occur, cultures of several primitive extremophiles or archaea were added that could withstand greater variations in such things as acidity, aridity, gravity and radiation.

Additionally, newer cryo-science enabled the scientists to add the common earthworm to the passenger list. Earthworms share 90 percent of their genome with the human species and a meticulous process to lyophilize or freeze dry them produced a lifeless state that could last centuries without destroying their viability. Indeed, slow rehydration, cell wall stabilizers and caffeine worked magic in restoring these creatures to their natural state. Moreover, earthworms could be genetically engineered to survive on land or in the water by introducing messenger RNA that could adjust their metabolism to either aerobic or anaerobic conditions. The scientists reasoned that if in the second phase of the program the transplantations of humanoids did not succeed, the survival of the earthworm might independently lead to an evolutionary process.

After arrival at a distant planet, an array of caretaker robots would orchestrate the revival of these species in a controlled environment within the space vehicle. The robots would release them on the surface of the planet when they were fully revived from the rigors of the journey and could reproduce.

Hundreds of missions had perfected and mass produced a very reliable disc shaped space vehicle for prolonged missions into space. These exhibited a degree of engineering perfection that exceeded six-sigma and the World Space Agency confidently ordered 500 space vehicles with specifications suitable to reach either a primary or secondarily planet destination.

The standardized capsules measured 4 meters in diameter and 1.5 meter in thickness. The structural components weighed 110 kilos with a payload capability of 400 kilos. The lower surface of the capsule was laminated with multiple layers of impregnated carbon 'buckyballs' to act as an adamantine heat shield and a middle layers of nano-lead sulfide to minimize the effects of space radiation. The upper surface of the capsule was similarly constructed, but of lesser thickness.

The outer skin of the capsule had multiple sensors to gage distances and measure radiation level plus record gravitational and electromagnetic forces. A quantum telescope and chemistry laboratory was layered on both sides of the capsule to continuously monitor the prime destination and provide the data to alter course to a secondary planet, if necessary. All data was processed in a central command cylinder.

The vehicles had one main atomic propulsion unit that captured energy from cold and hot nuclear fusion by bombarding ultra-heavy deuterium and tritium (DT) with dineutron and tetraneutron clusters activated by a high energy laser. This produced a stream of high velocity neutrons, quarks and neutrinos through a dual exhaust system capable of controlling speed and direction. In outer space, velocities up to 17 percent the speed of light could be achieved. In addition, four small ion thruster engines were mounted circumferentially to afford greater navigational control. These also generated electricity for heating and recharging the ion batteries of the computers and robots.

Even in the vacuum of space, acceleration was very gradual and it took 30 days to reach the maximum speed of 16 percent the speed of light. The calculations to decelerate for landing were the most challenging as they required a precise fix on the landing zone more than a year in advance and a descent formula that factored in gravity, electromagnetic fields, dark matter forces, radiation effects and the planet's topography.

In the vehicles, twenty elongated cylinders that were equally spaced around a central compartment contained the cellular colonies and masses of earth worms. A dedicated duo of robots managed and nurtured each cylinder of live cargo. These tiny administrators measured two centimeters in length and one centimeter in width with six legs and a frontal set of jointed three-pronged graspers and cutters. A small spoon-like attachment facilitated the transport of liquids. Their two small sensing antennae gathered environmental information that was transmitted to the central

control module that coordinated robotic activities. For some activities, the robots were programmed to think independently.

The capsules main compartments were filled with nutrients to nurture the passengers plus ample quantities of water, carbon dioxide, oxygen, ammonia and trace elements to add to the environment and foster ecosystem development.

Clear transmission of data directly from the capsules to Mission Control was feasible for a distance of one light year. To greatly extend this range, the space engineers came up with the idea of a network of interconnected relay stations to enable communication over much greater distances. Additionally, to construct a communications network, they elected to launch all capsules in a 30 degree cone shaped trajectory from the earth's surface producing an equilateral distribution. This was feasible because there was a concentration of favorable exoplanets in the Taurus Constellation that was just 150 light years from our solar system. Each space capsule carried 100 relay stations that could be placed in a stationary grid utilizing gravity and electromagnetic forces in interstellar space. Each relay station had a caretaker robot to coordinate transmissions and prepare for relay station enhancements in the second phase of the Last Frontier Project. If successful, this matrix of relay stations would blaze a trail for subsequent space travel and support the launch of the Second Phase scheduled to begin in five to ten years. Moreover, research into laser technology and information transmission suggested the possibility that the speed of light could be exceeded by a factor of 4-6 times using turbo-charged lasers. Such a miraculous breakthrough would greatly facilitate all aspects of the project.

Even with such a complex project that defied precise scientific analysis for success, the scientific community was optimistic because there were many exoplanets and their moons that were quite similar to earth and favorable for the transplantation of life. At the end of the day, the collective belief was that at least fifty percent of the space capsules would reach their

targets, ten percent would transplant one or more life forms and overall one percent would be successful in establishing an ecosystem that supported an evolutionary chain of event and the Second Phase of the project.

The two-step Last Frontier Project became a symbol of the indomitable human spirit with a potential to insure that life, as we know it, would be eternal. The project also reinvigorated the World's scientific community and opened up a new era of research by generations of super-bright scientists with super-charged DNA that made John Steward Mills' IQ of 200 look average.

During the two years prior to the first launch, revolutionary discoveries occurred in nuclear physics. When neutrons were subjected to turbo-charged laser beams that exceeded the speed of light, it produced in quantity the previously discovered Higgs particles or bosom plus its antimatter counterpart that was called Higgs II. Moreover, neutrons were found to contain two antimatter quarks and one matter quark, while the protons had two matter quarks and one antimatter quarks. To reconcile this new scheme required a new fifth force that intervened in preventing matter and antimatter from annihilation. This fifth force was named the 'coexistent constant' and related to further tiny subatomic particles called prions. This discovery explained why the total matter in the universe could increase and avoid the annihilating effects between matter and antimatter.

The initial phase of the Final Frontier Project took just 20 years to complete, but its ripple effect to bring the nations of the earth together and the attendant scientific mobilization had lasting effects on planet earth. It proved to be the single nonpartisan issue that resonated within all political parties. Indeed, the new President of the World Federation in 2056 was its strongest supporter and a leading scientist without a law or business degree.

The space capsules were released one by one from a massive Space Station positioned in a stable position 15,000 miles above the earth's crust. A catapult was used to launch the vehicles and exert nine Gs for three

seconds to enable the vehicles to escape the Earth's gravitation pull without consuming inboard energy. Two were released each day for 250 days and one famous physician who was the Space Station's commander remarked at the initial launch how similar the vehicle looked in appearance to the 'flying saucers' described in the history books from the 20th Century.

Foreshadowing Addendum:

In December 2054, the engineers and biochemists perfected the technique of 3 D printing to produce single cell organisms and tissues. In the next Chapter we will take a futuristic look at how this technology might be instrumental in transplantation.

A FACT SHEET

1. Life is an organized genetic unit capable of metabolism, reproduction and evolution
2. Life on earth began nearly 4 billion years ago and for 2 billion years all organisms were unicellular and confined to the oceans.
3. There are 20 trillion galaxies in the Universe each with 100 billion stars.
4. Although structurally less complicated than eukaryotic cells, prokaryotic cells are functionally complex carrying out thousands of biochemical transformations and processes.
5. At rest an average person hydrolyses and produces about 40 kg of ATP per day.

6. Baryons are a collective term for protons and neutrons. Conventional models theorize that the big bang produced quarks that united in groups of three to form protons and neutrons.
7. The string theory –a speculative extension of the Standard Model that attempts to describe all forces as the vibrations of microscopic strings
8. The big bang occurred anywhere from 13.7 and 16 billion years ago.
9. Professor Hoyle postulated that the smallest conceivable free-living life form needed at least 2,000 independent functional proteins in order to accomplish cellular metabolism and reproduction,
10. Biobricks are strands of DNA that have universal connectors at each end—a combination of genes that acts as a standardized component
11. Spintronics—storing bits of data on a single atom
12. The Higgs Boson or ‘God Particle’ is defined as a particle that completes the Standard Model and is the source of universal mass
13. The Milky Way is a spiral galaxy 100 thousand light years end-to-end in which several arms seem to unwind from a central region.
14. Buckyballs are individual molecules composed of exactly 60 carbon atoms that cannot extend themselves in any direction.
15. Dark matter that allegedly makes up 80 percent of all the matter in the Universe was detected due to its gravitational effects on ordinary visible matter. It has no electrical charge and does not feel either the strong and weak forces that bind atomic nuclei together. Its nature is unknown although some scientists conjecture that it might be comprised of sterile neutrinos.
16. Before it undergoes apoptosis and dies, the maximum number of times that a human cell can divide is roughly 50.

17. A quantum computer capable of processing multiple calculations uses electrons (electrically charged atoms) trapped by oscillating electromagnetic waves as its qubits.

18. Most scientists view evolution as an extremely circuitous process, but nevertheless a linear one in a carbon, hydrogen and oxygen environment with a stepwise ascent up the chain of more differentiation and complexity. Hubris had inculcated the belief amongst the scientific community that humans are the definitive end point.

The Next Paper **MACHINES MAKE THE MAN**

Relay station enhancements and interconnectivity and supplemental craft to service them. 30 degree cone shaped arc; ie 500 in a circle of 1 light year, and 500 in a circle of 2 light years away. Make up of relays---communications, solar cells, laser communications. Turbo charged communications with laser—solid items could not travel that speed

A second set of larger vehicles to supply, repair and update equipment, robots, test ecosystems in space, telescopes and detectors, keep of stations networked and a master plan,

Name the planets—4 in all developed ecosystems within 1 light year distance from each other—two adjacent galaxies had several livable environments, quite similar to earth.

1. Six clones each with names sent on each space vehicle in hermetically sealed packages—conformed to body contours with CO₂ gas replacing WATER and long—less than 10 lbs. Space vehicles 4000 kilos, launched from same satellites but under their own power. Exact copies with micro MRI scanning to a 3 D printing from a protein/chemical/enzyme/ DNA/RNA based upon the 1253 enzymatic processes and tissue structures in the body. Added stem cells and tissue replacements. Subsequent models with varying perfect sperm and ova genetics, transport in absolute zero temperatures, dry **cellular** forms devoid of water, sodium, **a brain**

pacemaker with deep brain stimulation(COBINATION OF MAN AND MACHINE) and central control robotic module that held the elements of identity, culture, behavior that reestablished circadian rhythms including sleep, intestinal function (including biomere) , and all coordinated muscular activity of the body, intact nervous system including motor, sensory, olfactory and visual cortex, speech center, except for short and long term memory, and had to be taught by audio and visual stimuli during the year long sleep cycle (subconscious sleep learning) induced at the end of the voyage augmented by programmed robots. Woken up by brain pacemaker after one year—very long process of reconstitution

Programmed for division of labor—women childbearing, nurturers, men-food gathers

to initiate life---to revive add hypotonic solution (like a LURP meal) to hydrate intracellular space, add water to 3D whole blood, and infuse to reconstitute circulation. Heart pacemaker. Strong addiction center for sex and positive reinforcement,

Hard wired for routine daily activities—eating/hunger, drinking/thirst, gardening, hygiene, sex,

After entry—farmers, programmed to eat algae and earth worms,

2. Structural Components of cell walls and DNA and RNA ONLY, Ringer's lactate solution
3. Packages of partially differentiated organ stem cells to form various organ systems and major vascular structures connected by Capillary Stimulation Factor for microcirculation. Engineers by the robots after arrival. A reverse Frankenstein process—robots to humans.
4. Sleeping brain that with telepathic instructions via computerized brain pacemaker directing activities concerning fertilized ova.

5. Hydroponic fetuses genetic engineered to accept a computer brains with knowledge and program to reproduce and care for a family unit tended by robots
6. Robot families that could build a human from any of the above such as stem cells (how can you get stem cells to survive—make them from scratch) organ colonies.
7. Robotic space scientists and chemistry laboratory
8. Anhydrous RNA, DNA, AND CELL WALLS skeleton via 3D printing with an intrinsic integrated and added BRAIN pacemaker that was integrated with hypocanthus and frontal lobes to initiate memories, morality and cultural characteristics and inculcate knowledge while still asleep or in an unresponsive state. Separate temporal lobe brain stimulator that would initiate consciousness. Part of the Brain Mapping project from the early 21st century. Hypertrophic lymphatic system to instill intracellular fluid, vascular system to infuse artificial blood that would be replaced with blood as the bone marrow began to function.
9. Have a genetically engineered animal with replace gonads that reproduced humans.

THE COLONY FORMATION THE GARDEN OF EDEN

FIRE, METAL,

