The Space Scouts

A Field Manual Parody
by Jim Davidson
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Kansas Search & Rescue

The following document is a parody. It is meant to be viewed as sarcastic, sardonic, and satirical. Taking it seriously or acting on any of its contents is entirely discouraged, and any such undertakings should be done away from home and under the active supervision of adults.

The author would like to recognise and honour Ben Stone of BadQuaker.com and Twitter.com/BadQuakerBen for originating the idea of field manual parodies to advance the cause of abolition of human slavery, including the abolition of the state.
May you find the friends you need, and befriend the folks you find.

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Space Scouting

A field manual parody

Several important understandings are fundamental to making our species free. I believe mankind's most important objectives include freeing the slaves, stopping the wars, and ending the state. Knowledge is one vital element in our work.

Please understand that you live in a Solar System. You do not live only on a planet. If Earth were not part of a Solar System, with no star to heat our world it would be much colder – close to absolute zero by a few degrees on the Kelvin scale.

Please understand that without the planet Jupiter, our planet would be very much more vulnerable to impacts from asteroids and comets. Without Venus, Mars, Jupiter, Saturn, Uranus, Neptune, Pluto, Ganymede, Io, Europa, Titan, and the other planetary bodies with atmospheres, volcanoes, cryospheres, or weather, we would understand far less than we do.

Please undersand that while you often live and work on Earth in a seemingly two-dimensional world, your universe probably consists of at least 12 dimensions. Thinking linearly, in two dimensions, or even in three dimensions is insufficient to your needs. You must begin to think in at least four dimensions – three space dimensions and the one time dimension you find most familiar.

In order to live free on Earth, mankind will need to live free in the Solar System. Beyond Earth are resources of time, energy, position, materials, and opportunities that cannot be found on Earth. Moreover, these resources give keys to many of the specific problems of Earth that, while potentially soluble without space resources, become much easier to solve with the application of both space resources and resourceful thinking.

Now therefore you and many others would like to examine the body of knowledge needed to become a space scout, a small part of which is in this field manual. Like all scouts, you will venture into unknown or uncharted or misunderstood volumes of space, visit other worlds, and see things from a new perspective. You will see some things never before seen by a human being. You will see in new ways. You will encounter other space scouts, and if circumstances arise, you may even encounter a space scout that is not human. Being on the edge of human experience may bring you into contact with anything. You will be given insights to find paths that others will follow. You stand at the beginning of an amazing journey into the future.

Everything comes into play. All the assumptions you have lived with all your life are up for grabs. The concepts of up and down, the dynamics of water, the physics of buoyancy, convection, even how a ball is affected by Coriolis forces in flight – everything you know and think you understand is all based on the special case of one planet, one rotating ball in space, one gravitational field, whereas the universe is much more complex.

As a space scout you will venture beyond Earth's atmo and find a seemingly weightless environment.

You will experience accelerations much greater than one gravity to get off Earth (three to seven gravities are typical) and microgravity so tiny you won't perceive it.

Everything you see from high altitude atmospheric platforms to orbiting space platforms to cities built from new materials between planets – you will see and understand differently from your terrestrial brothers and sisters. You will share with them sights and sounds, yet the experiences will still elude many.

The space scout steps forward beyond the steps of anyone else. Scouts see everything anew and these experiences work a sea change on your soul. As scouts come to live in space in dozens, hundreds, and thousands, you will make homes there, raise families, teach children, find one another, and be at one with the universe.

In that oneness and from your position you will be able to bring new insights and take direct actions to alter the ways people live on Earth. Your choices will affect many lives. Thus, in reading this field manual and in studying to become a Space Scout, you should seek not only knowledge but also wisdom.

Seek to be wise enough to free others from bondage. Seek to be calm enough to refuse to initiate aggressive force. Seek to be brave enough to rapidly and effectively respond to aggression with defensive and retaliatory force to eradicate the aggressor's ability to make war. Seek to be kind enough to stop wars amongst others. Seek to be independent enough to never have a master in human form.

Seek then to be worthy of your role in the universe.

Space Scouts lead the way.

Who Are Space Scouts?

Anyone old enough to shoot a rifle accurately who says “I am a space scout” should be recognised as a space scout. Some scouts will have more experience than others. We may define “accurately” with regard to rifle shooting as having at least five rounds out of six rounds shot fit within a circle one inch in diameter when the shooter is firing from 100 yards distance.

Remember the fourth dimension. As children take on knowledge and responsibility, they grow into the power and duties of adults. As children seek to be taken seriously, the wise adult chooses to take them seriously. Age is, after all, mostly a social construct – it confers nothing by itself. There are forty-year-old mentally-challenged persons who can neither feed nor clean themselves. There are 8-year-old prodigies who have composed masterpieces.

Remember that by the time Mozart was my age he had been dead for 19 years. Alexander of Macedon's father instituted the tradition of having officers shave their faces so that his teenaged son, when giving orders, would appear no different from the other officers in their helmets and armour. Alexander went on to conquer the known world of his day, spread Greek culture far and wide, all by age 33. Watch them, guide them, and by all means verify their results as you think best, but do take all Scouts seriously.

Space scouting is a club, a school, an opportunity to teach and to learn, a team, a set of lone and very self-sufficient individuals, and the very front line of the liberation of humanity. We go into space to bring freedom to a world in bondage. Each scout is a force of one capable of any task a human has ever performed. On mankind's frontiers below the oceans, in frozen Antarctica, and out in space, the Space Scout is capable of doing tasks that no other human has ever done before. Above all, the Space Scout is wise enough to know what to do, when to do it, and when to take no action.

Scouts learn all the time.
Scouts listen all the time.
Scouts prepare for everything they can imagine and imagine as much as possible.
Scouts read, think, meditate, dream.
Scouts meet to talk, plan and teach one another.

As a scout, especially when talking to another scout, the answer, “I don't know” is always acceptable. The answer, “I don't know,” should be followed by an offer, “I can show you how,” or, if that's not possible, “I don't know either.” Never be afraid of your ignorance. Your ancestors grew up in much more ignorant times, including the first two decades of the 21st Century, and enough of them survived that you are here.

A scout is always honest with another scout. A scout owes honesty to scouts, family, friends, and lovers. No scout ever owes honesty nor any other thing to slave owners, to slave keepers, to overseers, to any government agency. Every scout is duty bound to free slaves by the most effective means possible. Every scout is mindful that we stop wars.

In the context of freeing slaves or stopping wars, a scout may be at war. No scout ever fights half a war

– every enemy must be vanquished. An enemy is vanquished when they can no longer make war. A scout does not leave another scout behind except to go bring rescue. No scout accepts collateral casualties nor any other euphemism for killing bystanders.

A space scout is a person who believes that no one has the right, under any circumstances, to initiate force against another human being for any reason whatever, nor will a space scout advocate the initiation of force, nor delegate it to anyone else. A space scout is always prepared to defend life, liberty, and property as that individual thinks best at any moment.

We live by these values. We are loyal to our core beliefs. Scouts have honour even if having honour kills us. There are many things worth having that are worth dying for, and among these is the conviction that you have fulfilled your personal obligation to do what you know is the right thing to do.

How Do You Know?

The Story of Aristarchus

You live on a spinning ball. Earth is a sphere, more or less. You can prove this fact to yourself by observing the universe. The Earth casts shadows on the Moon at every lunar eclipse. Always the shadows are arcs. The Moon is also spherical, which you can see clearly by observing its phases, and also by observing the shadow the Moon casts during every solar eclipse. Only two bodies that are essentially spherical are capable of consistently casting the shadows you see. You don't need to await a total eclipse – any partial eclipse of the Sun or the Moon can be useful in your collection of data on this topic.

Feel free to take a light into a dark room and experiment with a large ball and a smaller ball. See whether you can re-create the kinds of shadows you see in an eclipse. Then see if other objects make the same kinds of shadows. For example, anything with “four corners” is unlikely to cast the sort of shadows you see during eclipses.

You can observe Coriolis forces by simply emptying a bathtub by its drain hole or flushing a toilet. You always see the water rotate the same direction unless you visit the opposite hemisphere or find yourself directly on the Equator. You see the same sort of rotation in hurricanes and tornadoes, which are atmospheric phenomena that occur widely. Check out a satellite image of a hurricane, with super-imposed radar data, of which there are a great many videos. See if it matches your observations of similar events in real life.

Not only can you establish by direct observation that Earth is a spinning ball, you can use simple mathematics to determine how big it is. All of these facts have been previously known to ancient people. They used mathematics without computers, without smart phones, without pocket calculators, without slide rules. Some even wrote their equations in sand using sticks. If you get the answers right, and your work checks out, why fuss about the tools? For one thing, many people who have practice can do complex arithmetic problems in their head faster than you can key in the equation.

Scouting is not about having the coolest tools, it is about understanding what's around you and responding to conditions in real time. In practical terms, that means doing things in your head to leave your hands free to drive a vehicle, shoot a weapon, or field bandage your buddy. If you don't have the multiplication tables memorised up through 20 times 20, there is no better time to learn than today.

Having said that ancient people knew these facts brings us to the important issue of how widely this information was distributed. After all, if you, as a Scout, discover a vital fact and then die ten minutes later, that information may not become available to anyone else until they get to whatever edge of human activity you were covering. Be classy, pass on the information when you can. Given that there have been dark ages when, apparently, matters like whether Earth was a sphere and whether the oceans were all connected seem to have been lost knowledge, we have to suspect any system which imposes tyranny by fostering ignorance.

So we come to the story of Aristarchus of Samos. He lived at the time of this story, in the city of Alexandria in Egypt. Look at a map or globe and locate Alexandria to better understand this story.

Alexandria is about 31 degrees north of Earth's equator. It is also, therefore, north of a special line called the Tropic of Cancer which is roughly 23.5 degrees north of the Equator. It is named after the constellation of Cancer and has no particular cancer-causing properties.

The tropic lines, 23.5 degrees north and south of the Equator are important because the latitude in degrees exactly matches the axial tilt of the Earth. Axial tilt is the reason for the seasons. It is a consequence of axial tilt that the Tropic of Cancer is the northernmost latitude at which the Sun is ever directly overhead.

The Sun is directly overhead on the Tropic of Cancer at exactly noon at the Summer Solstice which comes in late June by our current calendar. There is a city in Egypt called Cyene which was known to have a well dug straight down, directly on the Tropic. At noon on the Summer Solstice each year, the Sun would shine straight down into this well. The water at the bottom of the straight, vertical shaft would reflect the light of the Sun. The walls of the well shaft would cast no shadow. This fact was considered quite unusual, worth observing, and news of it travelled widely. Hey, it was ancient Egypt, they didn't have cable television.

Why were no shadows seen? Because at noon, on the Summer Solstice, on the Tropic, the Sun would be directly overhead. No shadow would be possible. Aristarchus heard of this well, and he began to think.

At the time, Aristarchus already had a model in his head, which today's scientists might name “an hypothesis.” In his model, the Earth and the Moon were spheres, the Sun was much further away than the Moon, was also a bright light, and might further be presumed to be spherical based on matters like the eclipses of the Sun by the Moon persistently showing those arc-shaped shadows. What Aristarchus wanted was to understand the scale. How big was Earth? How far was the Moon? How far was the Sun?

Aristarchus could measure the shadow cast by a pole of known height held vertically. He could measure the length of that shadow at noon on the day of the Summer Solstice. If he also knew the distance from Alexandria to the well at Cyene where there was no shadow at the exact same time on the exact same day, he could use trigonometry to work out the total circumference of the Earth, given such previously known facts as the equation for the circumference of a sphere.

At this point in our story, rather than telling you that equation, or suggesting that you simply take my word for it that you can use mathematics to make such a calculation from such limited information, I suggest you take up some mathematics text books, or gather information about mathematics from web sites, or learn about maths in whatever way suits you best. Look into it. Verify what I'm saying.

Figure out how to calculate the same information for **any** body you happen to be standing on, if it is reasonably spherical. You might be on the Moon or Mars and simply be able to look up that information, but you might be on a previously undiscovered planetoid, dwarf planet, asteroid, comet, or other planetary body and have no choice but to use your actual wits.

Also, please spend a bit of time thinking about what facts Aristarchus needed. He needed to know the length of two shadows at the exact same moment in time cast by the Sun, effectively a point source of light far away in the sky. It happens that one of those shadows had length zero, but if he could have

gotten the length of another shadow not necessarily on the Tropic, and be sure that it was measured at the exact same time, he'd be all set, right? Don't expect me to tell you, figure things out for yourself. Would Aristarchus have needed to know his latitude, or not? How would you approach the problem of calculating your latitude in degrees?

When you are six light-hours from Earth, in a spacesuit, you cannot expect to find answers in a book that you don't have with you, which you can't see, and if you wait for a radio signal from Earth to reach you with the answers you seek, you may run out of air for your suit. So, do please make plans to be self-reliant in these mathematical matters. The life you save may be your own.

If you are going to be alone, on the frontier, taking choices based on limited facts and whatever results you can infer from what you know of mathematics and other data, you want to be confident. Be sure of your facts, be sure of your ability to work those facts into equations where they matter, and be aware that if you are in error, the choices you take are going to be in error, too. Do your best to be sure.

Today you can make the same experiment, or anyway, you can make the experiment on whatever day the Summer Solstice or an Equinox arrives in your hemisphere. Keep in mind that for the Scouts living in the Southern hemisphere, their “Summer Solstice” is in December, and the Tropic of Capricorn is the location where the Sun is directly overhead on that solstice day at noon. Instead of being the northernmost point where that is ever true, the Tropic of Capricorn is the southernmost point where that is true.

Also, don't expect the Sun to be in Cancer nor in Capricorn on the relevant solstices – these names were given to the tropic lines about 2,000 years ago. The precession of the nodes has moved the constellations in the sky significantly. Polaris is our pole star at the moment, but because the spinning ball we are on is “coning” like a top which spins but does not always point the same way, in a few thousand more years, it won't be. In 26,000 years, the physical pole will point the same direction again. You did remember the fourth dimension, right?

To do this experiment yourself, you need a pole or stick of known length. Try a measuring stick. You'll need a plumb bob to verify that the stick is completely vertical. Feel free to use feet or metres as you see fit. Track your units through the equation and you should be able to calculate a result in whatever units you prefer.

At this juncture, in case you are feeling embarrassed for Aristarchus, you should probably be aware that the ancient Egyptians had worked out a system of measurement based on determining an arc second of latitude along a meridian passing through the centre of the top of the largest pyramid at Giza. Unlike the French Academy of 1790, the Egyptians had their figures right, and built their “statute mile” accordingly. When they wanted to share the actual information they gleaned, the mathematicians working for the Temple of the Pyramid were capable of impressive accuracy and precision – something unremarkable to anyone who saw the pyramids and other structures they built.

Now, depending on whether you are working your calculation based on your direct personal measurement of your yard stick's shadow taken at noon on the Summer Solstice (June if you are north of the Equator; December if you are south of it) or taken at noon on the Equinox, you'll want to figure your distance from either the Tropic relevant to your hemisphere, or the Equator. Yes, if you think about it, you'll realise that the Sun is directly overhead on the Equator at noon on each Equinox, in the

Spring and in the Autumn. Remember, the result you are seeking to calculate is the total circumference of the Earth based on a known segment of it, preferably along a meridian or “line of longitude.”

Now, your author is not a witness to all these things Aristarchus did, as I am not quite as ancient and decrepit as all that, yet. The story as it has been handed down to me is that Aristarchus performed the mathematics, wrote out each step, and did everything correctly except for one crucial matter. As a result, he was exactly 10% off – too large – in his estimate of the Earth's circumference. It is also my understanding that he made an effective calculation of the distance to the Moon, which he discussed in his writings on these experiments. He is said to have also calculated a distance to the Sun, but supposedly was not willing to accept the answer – it was a distance he could not fathom. So he didn't publish that number.

Here again the Space Scout should be aware that if you know your facts and check your calculations, the universe isn't going to care if you don't believe your own results. Choose based on confidence or based on lack of it, but when you have to choose, you make a choice.

Rather than travel to Cyene to measure his baseline, tying a flag to a wheel, say, and counting its revolutions, or building a mechanical odometer as Archimedes is known to have done some years later, Aristarchus went and looked things up in a reference work. The reference materials he could access were the tax records kept at the Temple of the Pyramid for the entire Nile Valley. He lived north of Cyene. Most land in Egypt was aligned with the Nile River, which flows from South to North through the part of Egypt between Cyene and Alexandria.

Thus, to get his baseline from Alexandria to Cyene, Aristarchus added the north-south distance of each parcel of land between the two points – the well at one end, his shadow-casting pole at the other. Each parcel of land in Egypt that is irrigated by the Nile had been measured. Thousands of years earlier, geometers and surveyors from the Temple of the Pyramid recorded the size of each piece of land for the purpose of collecting taxes. As you know, taxation is theft. The priests wanted to steal part of everything grown or raised in the entire empire of Egypt.

The grain and other food grown on a given plot of ground would be estimated based on known facts about grain productivity at the time and how much could be planted on a given acreage of land. A tax on the food grown each year was stolen by the government of Egypt to benefit the priests of the Temple, the Pharoah, the bureau-rats, and the courtiers who were looking for government contracts. You know, the scum of society.

We have copies of what Aristarchus wrote, including the calculations he made, so if his mathematics checks out, why was his result wrong? In the 19th Century, the British, not being inclined to trust the records of any indigenous people, sent their own surveyors and geometers to make the same series of measurements. It became clear quite quickly that the tax records showed each piece of ground being 10% bigger north-south and 10% bigger east-west than it actually was. All those thousands of years ago, the priests had cheated to be able to excuse taking 21% more in taxes from every property owner.

The priests had the only survey tools. The priests kept the knowledge of their mathematics, the formulae for calculations, a secret from the general population. It was an hydraulic empire – they would punish rebellious communities by preventing them from watering their crops with irrigation waters – starving the enemies of the state into submission. They were, in short, slave holders. So, it

should surprise no one that the very first records we have of any government taxing any people reveal that those in power were cheating those without power to fight back.

As a result of this ancient fraud, Aristarchus, not willing to see for himself the distance involved by any direct measurement, relied on false records. He was off by 10% because the baseline he calculated came from a series of fraudulent records – each of which was written down to be a number 10% larger than what had actually been measured.

From this narrative, you should be able to form a sound opinion of governments. The argument that anyone ever owes “taxes” to anyone else has no merit. But, even given their own story for how they would calculate the taxes from each property, they were still not satisfied. So they lied to make everyone suffer more, pay more to the thieving government, and have less every year for themselves.

You should be aware that when you use someone else's data, they may have lied to you about what they measured. You don't know the validity of any data you are given. Trust, but verify.

As a Space Scout, you will have a need to know where you are on a planetary surface. You'll need maths to claculate orbits, to estimate fuel and air consumption, to work out depletion of food and other consumables. Learn mathematics. The more maths you know, the more certain you can be that your own calculations are correct.

As to the data you use, consider the story of Aristarchus to be a cautionary tale. When you can, make your own measurements.

You can see the importance of your honesty to other Scouts, to your family, your friends, your lovers. Do not betray your code of conduct. If you give a value that is 10% too high, or too low, to someone who uses that data to navigate from Earth orbit to Ganymede, they might not reach their intended destination. They might run out of fuel, or air, or food, and die before being rescued. Giving out false data can kill people. If you don't know the data, say you don't know. There is no shame in ignorance. Never make up a number when you don't know, and for every measurement you take, keep track of the estimated error involved. Be as precise and as accurate as you can. The life you save may be your own.

The High Ground

Why Space?

If you have read Ben Stone's field manual parody, you may have come to the realisation that abolishing the state once and for all is going to involve warfare. As Ben describes it, the necessary and effective form of that warfare is called 4th Generational warfare. It includes extensive guerilla operations – where forces of freedom are going to blend in with the general population, execute brief actions to take out select targets, and then blend back in.

Such warfare is not characterised by fighting pitched battles on identifiable battlefields. It is generally fought by forces that are mobile, few in number, and limited in capability on the one hand, and forces that are comparatively immobile, numerous, and extremely capable on the other. Those who represent the insurgency do not have to hold territory, are able to move about rapidly, appear to be just like everyone else, and are typically outnumbered.

Various authorities on counter-insurgency have estimated that it takes an occupation force something like 20 soldiers and support personnel to suppress a single effective insurgent. If you factor in the general population and tenatively identify them with the occupying army's “side” then there are even more people arrayed against the insurgents. They are very badly outnumbered.

Now, Voltaire apparently once said that God fights on the side with more battalions, but in fact it appears not to be the case. Anyway, insurgents in a great many different territories, all over the world, have fought armies of occupation to a standstill, and have won some important victories. The French could not hold Vietnam, nor could the Japanese, the Americans, nor the Chinese. The Soviets could not hold Afghanistan, nor could the British, nor, it seems clear by now, can the Americans.

One of the common features of the various successful insurgencies that we can track down through the ages is that they had terrain on their side. They were mobile and they moved in mountains or highlands. In Vietnam, “they held the highlands, we held the coastlines” is how various Americans characterised the situation. Also, “we held the day, they ruled the night.”

Space is a key element in contemporary American military doctrine. There is a “unified forces” or “combined sea-air-land-space” battle doctrine which includes space assets for global positioning, communications, remote monitoring, weather prediction, and many other strategic resources. It is also the case that essentially all space resources are automated, are unmanned. If they can be taken over by computer hackers, or physically approached, they can be used to shift the strategic balance.

It is also the case that space is the high ground. Sooner or later, space operations are going to include military operations. There are various historians, including James Oberg, who have convincing evidence that military operations in space date back to some of the earliest manned missions in the 1960s. It is not rational to believe that space forces will not be used in future battles, nor is it rational to believe that the Earth's governments will be abolished in only a few years time.

Further, there are a number of interesting facts that arise from physical reality which may have extraordinary effects. Did you know that it takes about as much energy to put a satellite of a given

mass into a lunar transfer orbit as it takes to put that same satellite into a transfer orbit to the geo-synchronous orbit where many communications satellites are parked? It is also possible from a lunar transfer orbit to use the Moon's gravity to help make an insertion into a very peculiar and powerful retrograde geosynchronous orbit. With one satellite moving backwards around the Earth, striking even one other communications satellite, or simply blowing itself up in that orbit, the debris should negatively impact or utterly destroy every other comm sat in geosynchronous orbit.

But wait, you say, the author has not explained orbits! Indeed.

Nor do I believe that is your best use of this field manual. Yes, I can put in some summaries of the mathematics of orbital elements, how to move from the x, y, z axes to a more effective approach using just six numbers to understand every orbit, and quite a lot of mathematics. I can also give you the ideal rocket equation, go into staggering detail about how conditions are not at all ideal when launching from the surface of a planet with an atmosphere, and indicate how the fastest way to understand how a given launch vehicle is going to travel is to use numerical modelling instead of exact calculation – there are way too many factors to make an exact model practical. If I tell you nothing more, I should mention that plane changes are expensive in whatever you use to change velocity.

Instead of those minutia, though, I am going to point you at some important resources. For example, Huron Rocket Society core member Dennis Feucht has published an extraordinary book on the topic at innovatia.com which goes into elaborate detail not only on how to predict how a given launch vehicle is going to travel, not only providing programming language for modelling trajectories, but also giving design details. With some practice, you ought to be able to build your own rockets of any size. Here is the link to that resource.

There are many other similar resources. I believe we currently have reasonable access for roughly a billion people to work, if they choose, on garage-based rocket systems. The tools, the supplies, the technologies, the mathematics, the chemistry, the materials, the money: they simply aren't that hard to get. Space access is not as difficult, dangerous, and expensive as you may have been led to believe by people seeking much larger budgets for their government space projects.

A reasonable estimate would be one person reaching Earth orbit for roughly 2,000 persons working a couple of days a week, or donating their earnings from a couple of days a month. It simply is not that hard to reach orbit. That is, not the poorest billion, but the wealthiest billion people on the planet have within their grasp the ability to put 500,000 persons into Earth orbit about 3 years from today, if they work effectively.

If I'm off by a factor of 10, that's 50,000 people in orbit. If 10% of the launch vehicles fail in one way or another, that's still 45,000 people in Earth orbit, able to operate for days or weeks, able to engage in all kinds of interesting activities. If only a tenth of the people who have access to the resources were to choose to engage in such projects, that's still 4,500 people reaching orbit, compared to the typical occupation of the internationalist socialist space station at 3 to 5, and the total number of people who have ever flown in space (558 as of 15 January 2017, according to https://www.worldspaceflight.com/bios/stats.php using the lowest altitude defining “space” at 50 miles altitude above Earth).

Nor, indeed, do you have to put humans all the way into space to get them into position to do some

really extraordinary things. A man recently skydived from the edge of space having reached that altitude in a balloon. Large and very high atmospheric platforms based entirely on lighter than air technology have been proposed by JP Aerospace since the early 1990s. When I say large, I mean thousands of feet in length, able to carry dozens of individuals, plus supplies for months of activity.

From 300,000 feet elevation even a very small rocket can be used to put a few pounds of explosive into any near Earth orbit you might like. From the ground, it would be challenging to reach the 10,500 nautical mile orbits where the global positioning satellites are found. Obviously not impossible to reach, since those satellites are there. (An exercise for the thorough researcher: What is the difference between nautical miles and statute miles, and what are the historical reasons for the use of nautical miles in space navigation discussions?)

Even harder to reach is the ~22,766 nautical mile orbit with zero degrees inclination, or circular around the Equator, where geosynchronous satellites are located. What's special about that orbit? Well, the Earth rotates once every 24 hours, roughly. At that altitude, the satellite orbits the Earth in 24 hours.

So it keeps station directly above some point on the Equator. Anyone below a certain latitude, with a satellite dish, and without a tall mountain directly to their South (in the northern hemisphere) can send and receive signals to and from that satellite. (You can estimate your latitude by looking at the angle a direct broadcast satellite antenna makes to the vertical – it would point straight up if you were on the Equator. You should be able to make a reasonable estimate of that latitude above which geosynchronous satellites are below the curvature of the Earth except for locations on very tall structures or very high mountain peaks, or somewhat high in the atmosphere. The thorough researcher would now research *Molniya* satellites, used by Russia to provide high latitude communications.)

Now imagine some group taking over a commercial communications satellite launch vehicle shortly after lift-off, and using that vehicle to place the comm sat into the above mentioned lunar transfer orbit for a figure 8 slingshot around the Moon to reach a retrograde geosynch orbit.

Or imagine someone very carefully shooting down every single National Reconnaissance Office asset – every spy satellite. Every Lacrosse radar satellite. All of the bi-static radar satellites that provide views into non-granite surfaces down to a kilometre or so. How would the loss of these resources affect the ability of the military to engage in its strategic operations?

Further to this point, what if each of those 4,500 previously mentioned individuals were to carry a few dozen crowbars with limited guidance systems. Dr. Jerry Pournelle, PhD described as similar system as Project Thor, though it was also the case that Zeus hurled thunderbolts from the heavens. By whatever name, a crowbar of steel hitting an M1A1 Abrams main battle tank at 17,000 miles per hour from an altitude of 200 nautical miles would, I believe, leave a crater about 100 feet across.

In other words, space is a potential force multiplier for either side. There is no reason to believe it is inaccessible. There are numerous reasons to believe it is not irrelevant.

Thus, at least part of my thinking with respect to the Space Scouts is that people who are aware of their life in the Solar System, even if they never leave Earth, would be able to think about the total environment of the fight to abolish the state better than people who are entirely terrestrial in their orientation. Moreover, even if you never leave Earth, you can still point binoculars, telescopes, and

computer-controlled optics at the sky. You can see Earth orbiting satellites as they cross the terminator – when Earth is in shadow and 200 miles up there is still sunlight, you can see reflected light from satellites. If you know where to look, you can easily spot a few satellites every evening after sunset, every morning before sunrise, including from time to time, the internationalist socialist space station. The higher the orbit of the satellite, the longer after sunset and the longer before dawn that it would become visible.

Tracking and cataloguing satellites is useful. If you know the ground tracks of every spy satellite in sun-synchronous polar orbits, you can plan your activities for times when there is no eye in the sky. Of course, there is orbital manouevering fuel on those birds, so they will be moved around. A competent celestial mechanic can estimate how much fuel is needed and what average drift in positions is likely, and still identify solid windows of opportunity for large scale operations that you want to have take place with no eye in the sky.

Space Scouts, therefore, have a lot of possible projects on which to work. They can build telescopes, add computer control systems, and look for spy satellites and other space resources. While they are at it, they might keep a watch on errant comets and asteroids that have orbits intersecting Earth's orbit – a particularly important project the dinosaurs of 65 million years ago seemed to have neglected.

Space Scouts might choose to begin some of those rocket experiments. Twenty years ago, friends of mine working in their spare time built a liquid fueled rocket that reached 20 miles altitude, over 105,000 feet. What could you do today? What could you do five years from now, starting today?

Even if you don't build the capability to launch a human being into Earth orbit, what might you be able to do with a rocket carrying 200 pounds of “payload” up 105,000 feet and more? What military targets without any civilians in the blast radius might be “targets of opportunity” for such a capability?

All launch vehicle technology is inherently missile technology. But if you don't want to make missiles, see what you can learn by taking a Go Pro and launching it with a helium or hydrogen balloon to 300,000 feet altitude. There are, as I say, lots of projects for Space Scouts who wish to explore our universe.

Get a telescope, preferably one that you can mount on a clock drive. A clock drive relates your telescope's platform to the sidereal motion of Earth as it rotates. It helps you keep the 'scope fixed on a particular part of the heavens. Add a camera to your system and take images. Adjust the camera to take very long exposure images and see some of the amazing universe around us.

Get a microscope, start looking at small things, and keep on looking. There is a universe in a drop of water. Learn about it. The more you understand, the more effective your decisions can be.

The Madness of Hierarchy

The Lesson of Sobibor

One of the most important things to understand is that you can form a group with other scouts, and with any other people as you see fit. You can work together as long as working together suits you. You can, as you think best, organise into groups, pick leaders, agree to accept direction, and do things that you think are good things to do. But there are a great many problems with mindless obedience, with always following orders, and with loyalty to a hierarchy rather than loyalty to principles. If you follow people instead of ideals, you risk losing your values. You risk being betrayed and, much worse, you risk betraying the things you believe.

There are a great many lessons from the global war of 1937 to 1945. It would be logical to regard that period as transformative, and it might not be wise to assume that it was the second of the world wars. From the collapse of the South Sea Bubble in 1722 until the Treaty of Paris of 1783, there were two world wars involving most European powers, several Asian powers, and New World powers. It is reasonable to number world wars sequentially, which places the war of 1937 to 1945 as the fourth world war.

If you are going to be a scout, if you are going to be a leader of people, you are going to need to know a great deal about mankind. One of the things you'll need to know about is war, where it comes from, why it happens, what you can do to prevent one or to end one, and how wars are fought. Since the objective of each side in a war is to prevent the other side from being able to continue making war, the goals of warfare relate to the goal of ending the state. Since war is the health of the state, ending war relates directly to weakening the state.

One of the great changes instituted in Prussia in the 18th Century was the new education system. Education was effectively nationalised, and education policy was to establish two groups of students. There would be students to lead, who would become officers, who would own and operate factories, who would manage and there were students who would follow and obey. The objective of the educational system was to do something which has since been proven to be impossible: making a managed society.

If you want to examine the economic facts of this latter statement, you should review the works of Carl Menger, Ludwig von Mises, Murray Rothbard, Samuel Edward Konkin III, and others. It would also be wise to review the works of Kurt Goedel, Nils Bohr, John Wheeler, David Deutsch, the basics of quantum mechanics, and quite a bit on chaos theory. The calculation problem alone illustrates the impossibility of a centrally planned, managed economy. But all those brilliant minds I've just mentioned in this paragraph? They weren't around at the time the Prussians decided to systematise their educational programme.

By the end of the 19th Century, the Prussians had built a substantial cadre of officers, managers, and some really excellent factories for building machinery, making cloth, and a system of universities and technical colleges well suited to inventing new things. They had also built a very large population of people who believed in following orders, in keeping their communities very orderly, and in bashing down all rebellious tendencies.

Rather worse for our story, their system had been spread very far. Americans such as Horace Mann brought the “Prussian education” system to the United States in the 1840s. The concept of nationalised education was a primary element of the *Communist Manifesto* written in the late 1840s. About a decade later, Japan's isolation under the shoguns was ended by American military adventurism, and the same educational doctrines were brought to Japan in her efforts to “modernise.” In the Western United States, states such as Wyoming have public education embedded in their state constitution in text that forbids the amendment of that provision, ever, despite the conceit that the constitution gives people the power to alter, reform, or abolish their form of government as they see fit.

If you want to know what happens when education is organised to foster mindless obedience, look at the 20th Century. You will find 262 million people are killed by other people who claim to represent a government. Not in war, not in combat, but in genocide. Dissenters, religious minorities, journalists, anyone who opposed the state, who opposed nationalism, who represented some “other” that had been vilified, deliberately, by those in power, were marched into death camps, herded into gas chambers, executed by firing squad, deliberately starved to death, sent to gulags, worked to death with food rations too low to sustain life, and otherwise destroyed. In addition to all these deaths, millions were killed in combat in World War One (so-called) and tens of millions in World War Two. There were a great many other wars during the 20th Century. The total death toll by government actions in all areas of human activity was enormous. Mindless obedience brought about the slaughter of hundreds of millions of people by hundreds of millions of other people.

The lesson of Sobibor is an interesting and enlightening element in this story of insanity. Germany under the Nazi government of Adolph Hitler (who ruled 1933 to 1945) was dedicated to a number of causes. One of these causes was “leibensraum” or “elbow room” meaning the conquest of neighbouring territories for the expansion of the German state, primarily for the benefit of the German people. Another one of these causes was the radically bizarre biology of racial purity. (It turns out that in biology we have learned about hybrid vigour, whereas racial purity and in-breeding have long been recognised as resulting in birth defects and monstrosities.) A major element of the racial purity dogma of the Nazi government was the elimination of the entire Jewish population of Europe.

Part of what killed people in Germany was the belief that they would be better off obeying the orders they were given than resisting. So it was with the Jewish people who were frequently told to obey, and even organised by their own co-religionists for that purpose. Some Jewish leaders and others paid by German soldiers to do so, told the members of the Jewish community in their town to follow the orders. “Mark your baggage so it will be returned to you when you reach the labour camp.” A great many lies were used to suppress any willingness to revolt. People were taught that resistance was futile. In fact, resistance is fertile.

One of the fairly new camps built during the last years of the war was at Sobibor. The process of killing people in large numbers would, at times, cause the German soldiers running a camp to close it down. There were not enough people left to slaughter, and the people further away would go to another camp. But there was the illusion that by cooperating with the authorities, some people would live.

Two of the prisoners who had been assigned to a camp to help organise the other prisoners, and help keep them calm as they were stripped of all possessions, shaved, gassed, and their bodies excavated for gold fillings, interesting tattoos, and whatever else might be taken, then incinerated, these two prisoners were sent by train to Sobibor. They were told that they would take up their same duties at the new

camp.

One of the men on the train suspected that they were being lied to, and that they would never reach Sobibor alive. So he wrote out a note describing his fears, and hid it in the lining of his jacket. His fears proved out, and the food he was fed on the train poisoned him.

Prisoners at Sobibor who had the same assignments were told to remove the dead bodies of the two prisoners in the well-appointed train car. They did so. Following orders, they also removed the clothing from these two. One of the Sobibor prisoners discovered the note hidden in the clothing, and read through it without alerting the German soldiers guarding the camp.

As a result of the warning hidden in the clothing, a group of prisoners at Sobibor organised a revolt. They recruited a few others, they made arrangements to kill certain guards in various ways, and they cut through the camp wire and led an escape. Of the approximately 800 prisoners in the camp, about 500 fled. But 300 prisoners decided to follow the rules, stay in the camp.

Now, the escaping prisoners faced a number of hardships. They were shot at, but the guards did not have enough ammunition, nor properly placed weapons to kill everyone. They had to navigate over the fences and through a mine field, and some died on the barbed wire, others were blown up by land mines. But hundreds escaped. Many of the escaped prisoners fought in the resistance forces, which led to some additional deaths. It is estimated that about 143 of the escaped prisoners survived to the end of the war.

However, every single one of the prisoners who stayed behind was executed. The German military not only killed all the survivors, they destroyed the Sobibor prison camp, removed all evidence of its existence, and planted trees to hide the location. The fact that people were willing to resist, even in such seemingly hopeless conditions, is one of the great triumphs of the human spirit over tyranny. It is also one of the great embarrassments of the Nazi regime, incontrovertible evidence that if people resist they can overcome guards, seize weapons, and get away. If only more people had resisted, the death toll in the camps would have been much less.

You are contemplating a future as a space scout. You are going to plan and organise activities involving several people, and, at times, many dozens or hundreds of people. When you need a hierarchy, when you need clear lines of communication, when you need clear understanding of who is in charge, you are free to form a temporary hierarchy. Build an organisation. But always remember Sobibor. Always remember the difficulties inherent in permanent hierarchies.

We have a word for the kind of loyalty to an organisation that arises whenever people forget that they are brothers and sisters. That word is “egregore.” The organisation takes on a life of its own, and it becomes a threat to fundamental principles like zero aggression. You should not allow yourself to become a part of such an organisation. You should choose principle above expedience, temporary organisations over permanent ones, in order to be true to your values.

The Techno Nomads

Lessons from Somalia

Some years ago, I had the opportunity to work with Dutch diplomat and entrepreneur Michael van Notten. Michael and I worked on a number of projects in Somalia between 1995 and 2002 when Michael passed away.

At the time we were getting together for the first time to discuss Michael's work, a gentleman named Mohammed Farah Aideed, who had been the subject of an exciting manhunt by the USA army rangers in Mogadishu, Somalia, was killed by his bodyguard. It is an interesting aspect of his career that, at the time he was killed, he had just returned from a “peace conference” in a neighbouring country, where he was flown by the USA military. On his return, he announced his intention to become president of Somalia and form a permanent government. The elders of his clan, the Habr Gidr, told his bodyguard to kill him, and he was killed.

Much of the more interesting parts of the story of Aideed may be learned by visiting the *Philadelphia Inquirer* newspaper's web site and reading the articles written by Mark Bowden under the general heading “Black Hawk Down.” It is also possible to read Mark's book by the same name. It is my suggestion that you do so before watching the horrid, distorted, and propaganda-laced film “Black Hawk Down,” which does a terrible job of relating basic facts. If you read Mark's book, and never see the film that was very loosely and poorly based on his book, I think you would be better off.

The shillings

In order to understand Somali culture, which you may wish to do for any number of reasons, there are a great many books on the topic. I've read quite a few of these. One of the best books is “The Law of the Somalis” by Michael van Notten. He finished writing it and had it published shortly before his death. (I would describe his death as due to the failure of a replacement heart valve and numerous complications due to socialised medicine.)

It is definitely better to understand Somali culture by direct interaction with Somalis. Somalia was divided during the “Scramble for Africa” into five parts: present-day Djibouti which was the French Somali Coast; present-day Kenya which includes a few Somali-majority provinces; Italian Somalia; the Crown Protectorate of British Somaliland; and Ethiopia, which was given, by the British, two traditionally Somali provinces in a fit of stupidity by the foreign office in the 1950s. As a result of these machinations dating back to the 1860s, there has been a considerable diaspora of Somali people. There are now Somalis in many parts of the world, including the countries indicated, as well as parts of the British, French, and Italian empires. It is not difficult to find a community of Somali ex-patriates.

Certainly the best and most effective way to understand Somali culture is to live in Somalia for a few days, or weeks, or months. Should you choose to visit Somalia, it is important to make sure that you are doing so in a manner that is agreeable to the Somalis. The best approach is to make arrangements in advance to have a host or “abaan” for your visit, someone who is known in the community where you plan to visit.

Visitors to Somalia should be aware of several elements of Somali culture. Somalis are xenophobic.

They do not like foreigners. They are not agreeable to Somalia being home to a lot of people who are not Somalis. They are not agreeable to mixed race children growing up in Somalia.

If you travel to Somalia for the purpose of finding a young wife or young husband and going back to your country, living there, and helping your spouse send money home, you are likely to find some families quite agreeable to this prospect. But if you are expecting to start a business, live in the apartment above your shoppe, and persist in living and working in Somalia indefinitely, you should make one of two kinds of arrangements. Either you should identify an elder in the community where you want your business to thrive, and make sure he understands every aspect of your intentions and, if possible, agrees to judge you in disputes with Somalis, or you should make arrangements with an undertaker to have your mortal remains disposed of according to the tenets of your philosophy.

For example, during the time that there was a British-appointed governor living in Hargeisa in the Crown Protectorate of British Somaliland there was a rule in the 1895 agreements settling the war with the British colonial troops. The rule was that the governor, before getting back on a British ship to go back to London, would have his feet washed so that not one grain of soil from Somalia would end up in Britain. Simply put, these people don't want their country to be anyone else's country.

A careful reader will recall that I began this section of this chapter with the heading “The shillings,” and may also recognised shillings as a British coin. What you may not realise is that in 1900, the British shilling was a silver coin, not the pot metal token it is today. As a result, it may impress you that roughly 1900 a village in British Somaliland was visited by a troop of about 50 cavalry men led by an officer.

In this village there was an elder who was widely renowned. He was recognised as being very wise, and having a great deal of respect for Somali traditional law. He was also understood to be the best judge in disputes, the one who would always find a peaceful settlement even when everyone else had given up. Into his village came these British cavalry troops.

It is said, by the people who told me this story, that the wise old man was sitting in front of his tent. His children and grandchildren were herding his camels, goats, sheep, cattle, and horses. The British officer dismounted and came and sat with the elder. The officer explained about Queen Victoria, about the British solemn promise to protect Somali interests in their relationships with other European nations, and waxed poetic about peace, justice, and the Queen's good intentions.

He showed the Somali elder a silver shilling coin, with the graven image of the Queen. Presumably, from this part of the story, we may glean that the officer was a Christian gentleman and presumably ignorant of various provisions in the Q'ran about idolatry and graven images. In any event, he explained that it was the Queen's wish that the Somali elder, known far and wide for his wisdom and judgement, should receive this shilling. He put it in the elder's hand.

He then went on to say that every month, another officer would arrive, and another shilling would be provided. And all in recognition of the wisdom, judgement, and good fellowship of this Somali elder. Then the officer got on his horse and went on his way, taking his cavalry soldiers with him.

Indeed, it came to pass, in the fullness of time, that the British kept their word. They sent a troop every month, an officer got off his horse, and a silver shilling coin was handed over. Then about 1905, a

religious leader told the Somali people that they were being fooled by the British, that they were being cheated in various ways, that they were being comprehensively screwed over, and that they should, in fact, throw the British out. He was called “the Mad Mullah” and other epithets by the British. Rather a large number of younger Somali men followed him into battles. Rather a lot of British soldiers expended rather a lot of machine gun bullets, laid down various snares of barbed wire, dug some trenches, a few early aeroplanes were brought to strafe and bomb Somali positions, and quite a lot of blood was shed.

Near the beginning of these hostilities a much larger troop, this time of 100 soldiers on horseback, rode into the aforementioned village. They found our hero the Somali elder sitting, as was his habit, in front of his tent. The British officer dismounted. He sat down – it is considered important in Somali culture to have meetings where everyone sits. It is rare that anyone rises to speak – no one is to be “above” everyone else. The officer launched into his spiel.

The Queen was very saddened by the news of violence in her Crown Protectorate. She was very worried about her Somali subjects. She wanted only the best. The Mad Mullah had stirred up the people and was a very bad man. Would the wise and wonderful Somali elder who was so greatly respected for always finding peaceful solutions please talk to the people, please help Queen Victoria in her earnest efforts to find peace? At this point in the proceedings, a trooper is said to have come up with a small oaken chest tightly bound with iron straps which was opened, and which had within it a few dozen silver shillings. The implication was clearly that the new supply of shillings was meant to encourage this peaceful man to talk to his people.

I was told that the Somali elder said, “I knew this day would come,” and then went into his tent. There he had a small box. He came out with the box, and emptied its contents onto the sand in front of his tent. Every single shilling that had been brought to him was in that box. He then turned and went back into his tent.

In other words, Somali justice cannot be bought.

Some trees grow taller

It is very clearly a custom in Somali culture that people gather and sit together at the same level. It is not the case that everyone is regarded as equal. There is a Somali saying or proverb, “Even in the forest, some trees grow taller.”

There are a wide variety of ways in which one Somali may be regarded by other Somalis as more equal or better in some ways than others. Women in Islamic cultures are expected to be subservient and are widely regarded as inferiors. Men who have made pilgrimage to Mecca are called “Hadj” as well as their first name, so one of the *abaans* I stayed with in Borama was known as “Hadj Ali.”

Hadj Ali owned some Mercedes long haul trucks, and a considerable number of Toyota pickup trucks. He bought and sold goods and provided transportation services. He was wealthy as such things go, and lived in one of the 15,000 “stone houses” in Borama. (Borama is a community of about 180,000 in the winter months when it is tolerable to live and work in Djibouti or elsewhere along the coast. It has a population of 600,000 in the summer months when being at 4,000 feet elevation makes the heat more tolerable.) Hadj Ali also had a .50 calibre machine gun in his truck yard, which was suited to mounting in the back of a pickup, making that vehicle into what the USA military calls a “technical.” He was an

adult man and therefore part of the militia in his community. I believe he had two wives, one of whom was extremely submissive and subservient and looked, to me, like she had been beaten recently. It was clear from a number of conversations we had that he liked Michael van Notten, thought that more trade and commerce would be a good thing, and wanted to encourage us to build our port city and toll road to Ethiopia.

It was in Hadj Ali's home that Michael and I had a number of very interesting conversations. One of the reasons Hadj Ali was willing to be our patron and have us as his guests is because Michael was married to an older woman who was a cousin of sorts to Hadj Ali. Her name was Flory Barnabas Warsame, and her family was prominent in the Samaron clan.

You may be wondering, then, how it was that Michael was in Somalia when he had a Somali wife. Two things are important in this matter. One is that Flory was beyond child bearing years when she married Michael. In fact, her previous husband, who had passed away, had given her several children one of whom was a fashion model living in Bordeaux. Two is that Flory was living at the time in Nimes, France, and would send money to her relatives in Somalia. In this way one who understands Somali culture would know that all was well, provided only that Michael did not buy land or take up permanent residence in Somalia. Renting a home or apartment and staying off and on for indefinite peiriods was fine. But it was only fine in the context of Michael, and his associates such as me, having a host or *abaan* as our patron.

Men who have reached a ripe old age, perhaps 35 or 40, perhaps less, seem to be qualified to be judges. Judges are a fundamental part of Somali culture. Everyone has a judge. If you do not like the person who is regarded by tradition as your judge, you can choose another judge. When there is no dispute to settle, no crime or tort to try, judges have another career. So their courts are *ad hoc*, for the purpose of the particular dispute to be settled, and cease to exist when that case is done. But the judge continues to be a judge. In some ways, judges have greater status and much respect. In other ways, judges are held to a higher standard, so if a judge commits a crime, he pays twice the penalty of anyone else. It was explained to me that he pays the penalty to make restitution to his victim or victims, and he pays the second penalty because he has, by acting criminally, betrayed the community's trust.

Within Somali culture there are sultans, elders, judges, leaders. A Somali clan may call up its militia and ask all able bodied men to defend the community. The militia may elect a war leader to lead them in battle. The war leader may be replaced if he proves to be incompetent or unlucky. Given all these levels of status and prestige, why has there never been a Somali king? On that matter hangs a tale:

The lamb's marrow king

It is Somali tradition that once, many hundreds of years ago, the Somali people got together and asked their elders to give them a king. The story as it was told to me is that the elders all met together for many months. They had long discussions. They chewed many bushels of the leaves of the tree that produces a kind of natural amphetamine and gives them a sense of euphoria, the leaves called *qat*. (One says “kat” with a very guttural initial consonant.)

In the end they determined that there was a man who was fit to be their king. They called for this man who arrived in the fullness of time. They explained to him their intention to make him king. They asked if he was willing to be king and properly discharge the duties. They told him all about being king. He thought it over and agreed.

The next day he was made king of all the Somalis. His first act was to demand that he be given a meal of lamb's marrow. He had heard, as the story goes, that by eating lamb's marrow he could remain young forever. Whether there is any truth to this view or not, a half dozen lambs were duly slaughtered, their meat was divided among the people, and the bones were broken, the marrow scraped out, and the meal presented to the king.

The day went on and the evening meal time arrived and the king ordered another meal of lamb's marrow. The next day was the same. It was clear to everyone that the king's intention was to eat nothing but lamb's marrow for the rest of his days.

The elders gathered the second night and held a meeting. They discussed the matter very quietly. They understood that all the lambs would be slaughtered, and they would send for the lambs in nearby towns, and eventually the entire country would have no lambs. Therefore no new sheep, and in a few years the existing sheep would pass away, and they would have no wool. Worse, they would have to trade with neighbouring communities in other countries for more lambs in order to feed the king's insatiable desire for lamb's marrow.

So they called together the militias of the clans and ordered that the king be killed. And to this day, the Somalis have never had another king.

My purpose in relating these stories to you is to suggest that there are plenty of ways of organising people into communities, into groups, into militias, and into sophisticated companies. You can engage in trade and commerce, have justice, and defend your home, all without having to have a centralised state of omnipotent power. Given the extensive difficulties we've all encountered with great big governments, you would be wise to pay heed.

In some ways, this last story, about the lamb's marrow king, relates directly to the first story, about Mohammed Farah Aideed being killed by his own bodyguard. What 500 US army rangers were unable to accomplish in 1993, one man standing next to Aideed did one day in 1995. There would be no President Aideed ruling over the Somali people. His own clan elders made it so.

You will also notice that, although the Somalis are not exactly enthusiastic about foreigners living permanently in their country, they have ways of approaching the issue peacefully. Not everyone who appears on their shores is instantly killed. They are happy to have trade and commerce with the wider world. Their practice of having patrons and guests is an interesting one, and part of a methodology for establishing local responsibility for someone from far away.

There is much to be said for the concept of pastoralism. It is very likely that the practice of taming and domesticating a few species of herbivores (horses, cows, sheep, goats) and protecting the herd from predators (lions, wolves, tigers) was a practice that arose some tens of thousands of years ago. Certainly there are reasons to suspect that some of the animal bones with tally marks that date back to 35,000 to 85,000 years ago may have been used to keep track of herds, or account for transactions involving them.

We might then suppose that after mankind lived as hunter-gatherers for two or three hundred thousand years, we adapted to our world by herding animals. It is fairly clear from the archaeological and

palaeontological record, as well as various anthropological data that we probably did not engage in extensive farming and settled agriculture until about 15,000 years ago, give or take a few thousand years.

A pastoralist is not necessarily a settled rancher. He may choose to move his herds from one pasture to another in order to maximise their production of wool, milk, or meat. He may have other exogenous reasons to move, such as conflict, trading opportunities, or the presence of someone some distance away he wishes to visit frequently.

It is in the nature of scouting that it is not a fixed activity. For as long as there have been people, it seems clear that there have been some who explored away from the crowd. Some went beyond the horizon, came back, and told tales by the campfire.

How will scouts on Earth live and work? They might live on farms or ranches, in cities or towns, and they might get quite a lot done browsing the universe using computer resources. On the other hand, they are scouts and, by the nature of scouting, want to see things at first hand. Where it is possible, they will report on what they see using various technologies of the day.

Mankind's ventures into orbit and to other worlds have mostly consisted of two kinds of trips. The first kind is a temporary visit for a limited period of time (not yet reaching two years total duration) where people go to a space location and come back. The second kind is of the sort where people have sent robotic equipment to visit a space location and send back data. Generally the robot is left where it is when it finally fails for whatever reason.

Given that there are no *in situ* resources at space locations, thus far, that provide for food, shelter, clothing, and breathable atmosphere, it seems likely that space scouts will bring with them most of what they need. Accordingly, neither a hunter-gatherer approach to living nor a settled farming approach is going to be the initial style of operation. Pastoralists, also known as nomads, move from place to place and typically keep all their possessions with them.

While space scouts are unlikely to bring herds of animals with them everywhere they go, at least in the early years of space settlement, they are more likely to seem like techno nomads than they are to seem like techno hunter-gatherers or techno farmers. Therefore, I have included some lessons from the Somalis.

Weimar mark, Yugoslav dinar, USA dollar

The lesson of honest weights and measures

"The coin is a delicate meter of civil, social, and moral changes. ... It is the finest barometer of social storms, and announces revolutions."
—Ralph Waldo Emerson, 1860 "Essay on Wealth."

In the long history of the externally imposed coercion of the centralised state, there have been many experiments with fiat money. What is fiat money, and who can we blame for it?

Fiat is the Latin word for "let there be" and is prominent in many Roman declarations. *Fiat lux* or "let there be light" are the first two words spoken by God in the Latin language version of the bible.

Many attempts were made by Roman emperors to debase their currency, but they always involved at least some precious metal. The same is true for the ancient Greeks. Roughly 400 BC, the playwright Aristophanes laments in the play "The Frogs" about silver-plated copper coins.

> "I'll tell you what I think abut the way
> This city treats her soundest men today;
> By a coincidence more sad than funny,
> It's very like the way we treat our money.
> The noble silver drachma that of old we were
> So proud of, and the recent gold coins that
> Rang true, clean-stamped, and worth their weight
> Throughout the world have ceased to circulate.
> Instead the purses of Athenian shoppers
> Are full of shoddy silver-plated coppers.
> Just so when men are needed by the nation,
> The best have been withdrawn from circulation."

Antony Sutton, in his extremely well documented examination of "the war on gold" by the book of the same name, discusses the mulberry bast paper created by Genghis Khan. Marco Polo remarked upon this black paper, with its vermillion ink markings. It was such a nasty tool of coercion, and caused so much suffering that four hundred years after Polo it was impossible for the British to hire anyone in India without minting copper coins for the purpose.

Since the hyper-inflationary blow off of the mulberry paper money of the Khanate Mongol empire, we have seen many other experiments in paper money. These include the American revolutionary war era "Continental" currency issued by the Continental congress under their imagined authority of the articles of confederation. American sailors returning to port in 1783 after the final victories over the hated and evil British (including sea battles near India that you probably never heard about—did you even know it was a world war?) were paid off in Continentals. They found that no shopkeepers would take the money. In protest, many of them sewed the worthless money into their clothing and marched down boulevards in Boston, New York, and Philadelphia. "Not worth a Continental" is still a saying for worthless money. Too bad, too, because the motto "Mind your business" on the currency is a very good one.

Too bad, as well, because the instability and difficulties caused by the fiat money of the articles of

confederation led to the establishment of a counter-revolutionary convention in Philadelphia. That convention met in secrecy. The delegates to the constitutional convention of 1787 swore a blood oath of secrecy, and their deliberations were kept a secret until after most of them were dead, largely because Alexander Hamilton was proposing to replace the free government of the USA with a tyranny. And in large measure did, as you can see by simply looking around you.

So fiat money ended badly with tyranny.

In 1789 the French held their own revolution, overthrowing a hated monarch. In 1790, the estates general met to issue paper money, allegedly "backed" by (but never redeemed for) the lands recently seized from the Catholic church (a tyrannical and hated institution). The king even assented to having his image and signature appear on the currency. But the national assembly was not satisfied and kept issuing more and more paper money, as detailed by Andrew Dickson White in *Fiat Money Inflation in France*. If you wish to understand the temptations of fiat money and its difficulties, you should certainly read this book.

In 1797, Napoleon Bonaparte won the hearts and minds of many in France by repudiating the fiat currency of the national assembly and of the directorate (the *assignat* and the *mandat*, respectively). He brought back gold and silver coins. Of course, he would subsequently steal a fortune in gold from Hamburg, and he raided the banks and private fortunes of people all over Europe. He also sold a vast tract of land called "the Louisiana Purchase" in an act of Jeffersonian defiance of the constitution—Jefferson repeatedly noted that he had no constitutional authority for the purchase—in order to get yet more gold. And blew most of it on an idiotic invasion of Russia. Thus always with tyrants.

So fiat money ended badly with tyranny.

The Confederate States of America endlessly printed paper money. President Jefferson Davis suspended *habeas corpus*, had pro-Union newspapers destroyed, and conscripted everyone from 15 to 55 into the military. At one point in March 1865 the Confederate congress voted to emancipate the slaves held in Confederate territory, and promptly conscripted them into the army.

So, fiat money ended badly with tyranny.

Lincoln issued the greenback currency. This infuriated the banking gangsters because it was not based on a note with interest payable to some bankers. This action delighted the Tsar of Russia who sent his Pacific fleet to San Francisco to help defend it against British attempts to seize the mint there, and his Atlantic/Baltic fleet to New York to support the defence of that city. I suspect that it was this support for the greenback that caused the banking gangsters led by Jacob Schiff who funded the Japanese militarists and the Bolsheviks to have the Tsar's family massacred after the 1917 revolution. (Didja know that Schiff wrote a $20 million check for the Bolsheviks? And arranged a $100 million debt financing for the Japanese to build up their navy prior to the 1905 war? Yep. You could look it up.)

The greenback was not as inflated by the end of the war as the Confederate paper money. But its eventual redemption was also not prevented by an amendment of the constitution. I believe the USA died as a sovereign nation when the so-called fourteenth amendment was ratified because, among other things, that amendment modifies the protection of the members of congress to say anything they please without consequence. In particular it says that the validity of the public debt of the United States shall never be questioned.

Lincoln also suspended *habeas corpus*, imposed conscription, and engaged in the aggressive use of total war against Southern cities. Slaves captured by Union forces were labelled "contraband" and frequently conscripted into the military. Sherman's march from Atlanta to the sea was noted for its

cruelty, rape, murder, and destruction of property by his "bummers"—men selected to go into the countryside, ransack homes, and set fire to everything.

So fiat money ended in tyranny.

On 10 January 1919 it was 12 German marks to buy an ounce of silver. Today it is about $17 to buy an ounce of silver. On 10 November 1923 it was 543 billion 750 million marks to buy an ounce of silver. That was the same day a strange little German guy who had been a corporal or something in world war one (so-called, though clearly not the first of many world wars) climbed up on a bar in Munich and declared a revolution. His name was Adolph Hitler. He would use the victimisation of Germany by the Versailles Treaty to justify extreme militarisation, genocide, and war.

So, fiat money led very swiftly to tyranny.

There are similar stories about the republic of China and their fiat currency under the tyrant Chiang Kai-shek; Hungary; South Vietnam; and many other places. In 1993 the Yugoslavia government began to inflate their dinar. They replaced it with a new dinar and lopped off a bunch of digits, then replaced that currency with the "new new dinar." That was in turn replaced, with a confiscatory exchange rate, by the "super dinar." In all, the Yugoslavia government imposed something on the order of five quadrillion percent inflation.

You may have heard about the genocides and war and bloodshed in that region which followed the collapse of the Yugoslavia government. You may have heard of Bosnia, and Kosovo, and other new countries formed as NATO attempted to intervene in the Balkans. You may even have heard of the USA role in these overseas adventures, these nation building endeavours, and of Michael New and his concerns about USA sovereignty. Or, you could look it up.

I think it is fair to say that the hyperinflation of the Yugoslav currency led to tyranny.

Of course, that isn't always the order of things. Very clearly Robert Mugabe was a brutal tyrant and a mass murderer before the hyperinflation of the Zimbabwe dollar. But that inflation led to even more suffering than he had already caused.

In September 1999, when gold was at its secular low of around $252 an ounce, Gordon Brown was selling half of the Bank of England's gold – we call that moment the “Brown bottom.” At that point, silver was $5 an ounce. Stocks were booming. In fact, priced in gold, stocks have never been higher than they were in 1999. Today silver has been close to four times the price it was in 1999. Gold has been about 5 times the price it was in 1999. These prices do clearly indicate significant monetary inflation. And the charts from stlouisfed.org tend to corroborate a dramatic acceleration of the size of the monetary base.

However, that increase in the monetary base has clearly been ameliorated in some ways, because prices have not tripled since October 2008 although the monetary base may have done if we trust the stlouisfed.org charts. (Gold was around $700 an ounce, and is not now $2,100 an ounce.) Why not?

Two reasons seem to be involved. One is, banks were not lending out the money being created, but using it to prop up their balance sheets. Now, that has recently changed.
http://www.fgmr.com/banks-are-lending-again.html

I think this fact of banks lending again means that much of the monetary inflation of 2008-2010 is now going to be expressed in higher prices. Gold has been setting new all time highs, and oil has started back up, too. (Bitcoin recently made another all time high, I believe.)

The other reason is that demand is broadly lower as many people are out of work. As many as 23.5% of

those who would like to be working are now unemployed, using the 1980 algorithm for unemployment and the government's statistics. Counting the long-term unemployed, as of January 2017, 95.1 million Americans are out of work. I don't trust the government's statistics, of course, nor do I trust the Feral Reserveless, but there isn't much in the way of independent data on this stuff. No audit of the Fed, nor of the Fedgov has ever taken place to my understanding. The government auditing itself isn't what is meant in business by "audit."

So, are we about to experience a hyper inflation? Possibly, but it is very hard to say. Remember that the Feral Reserveless System can decrease the money supply, too. In India, by an act of tyranny as far as I can see, prime minister Modi has declared about 85% of the currency of India to be worthless, and has utterly failed to make replacement currency available. In so doing, he has destroyed India's economy and eliminated all opportunity for prosperity for about 1.2 billion persons. I cannot imagine this state of affairs lasting long before violent rebellions lead to an even more brutal dictatorship.

Nor do we have to concern ourselves with hyper inflation as a cause of tyranny, since we already have tyranny. The president of the United States has authorised the execution of an American citizen without trial and without any of the other protections for the accused. The president has authorised the routine use of indefinite detentions and the routine use of torture. At least four dozen prisoners in USA military and espionage agency custody that we know of have definitely been tortured to death, and possibly hundreds more. *Habeas corpus* was suspended in 2006. The Foreign Intelligence Surveillance Act that Obama voted for when he was a senator pretends to authorise unlimited wiretaps and endless domestic espionage. The police have been nationalised and militarised and are more brutal than before with more people being beaten, electrocuted, and killed by police that at any time in the past twenty years.

What to do? Prepare. Buy guns, ammo, food, fuel, gas masks, build a bomb shelter, stock it well, prepare for civil unrest and tyranny, brutal repression and violent reprisals.

What to expect? Expect, as TE Lawrence once noted, just before taking 50 men across the Empty Quarter to conquer the four-thousand-man Turkish garrison at Aqaba, that "It's going to be fun." And if you do not share this peculiar idea of fun, well, too bad.

The future is long and not much is certain. But one thing we can be sure of: knowledge counts. One of the more interesting admonitions in the bible is a passage calling upon people to use honest weights and measures.

There was a time when the term “dollar” was defined, by the 1792 mint act in particular, as 371.25 grains of silver. This definition was honoured more or less continuously until 1964. In that defining act, the congress made it a death penalty offence to issue dollars with less than that amount of silver. Despite this intended enforcement, that weight is no longer respected. Scouts should carefully consider the importance of honest weights and measures – as with the previous lesson from Aristarchus. The numbers you use in calculations matter very much.

Finally, no chapter that begins with a quote about coins announcing revolutions would be complete without considering the Bitcoin revolution. Simply put, after the destruction of the e-gold currency by government actions in April 2007, a great many people began inventing better, more decentralised, and more effective online currencies.

Three of those people who set to work with a will were: Satoshi Nakamoto, Chris Odom, and Kevin Wilkerson. Each of them developed a separate system. Satoshi's system was called Bitcoin and began mining in January 2009. Chris's system was called Open Transactions and came to some prominence

when a company named Monetas began licensing it and operating out of Switzerland. Kevin's system was called Voucher-Safe and is integral to the SilentVault and Digital Cash operations. Each is a private monetary system which is essentially designed to be difficult for government agencies to destroy.

By late 2015, over a thousand crypto-currencies, many based on the white paper and design of Bitcoin, had been developed. Some of the prominent experiments on that much larger list include Ethereum, MaidSafe, Ripple, Litecoin, BipCoin, and DogeCoin. If you want a larger list, visit coinmarketcap.com and if you want to know more about Bitcoin or crypto-currencies generally, spend some time with their entries on Wikipedia.

Although I do not myself regard Wikipedia as authoritative in every article, nor do I care for some of their policies (the deletionists having focused much of their work on deleting biographies of anarchists), I do use it as a resource. Wikipedia articles often have footnotes and external links which are worth looking at more closely.

The published blockchains and similar data for the currencies tracked by CoinMarketCap indicate that about $15.7 billion in these currencies are in current circulation. The annual volume of transactions in Bitcoin using the last 30 days as typical activity would exceed $100 billion. Clearly there is a great deal going on here.

Fundamentally, Bitcoin works, in my opinion, because people are willing to accept it in trade and commerce. There are many ways to evaluate currencies. Good currencies tend to have features like: they are divisible, consistent, convenient, and widely accepted. Land and rare paintings make poor money since they are not easily divided – one part of a land parcel is likely to be more valuable than another; one rare masterpiece is certainly more valuable than another. They are not convenient to move about – whereas a digital currency like Bitcoin is very convenient. Numerous essays, including a dozen or more of mine, exist on the web where you can find them and review thoughts on what makes a good money. In many ways, what is relevant is whether the market finds the currency to be good money – market chosen money is always good in many important ways.

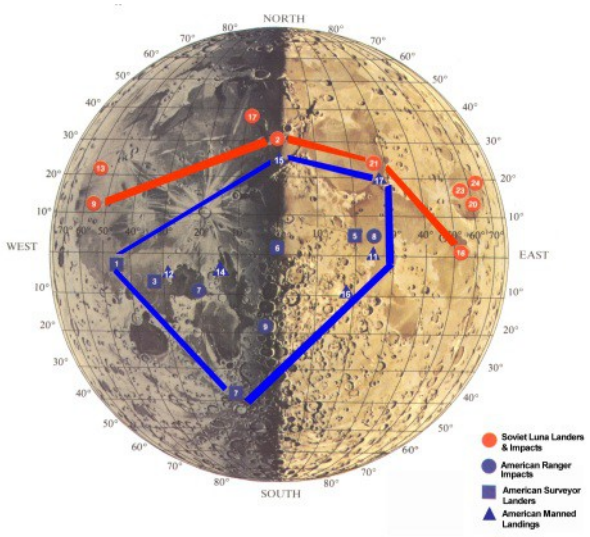
Views differ on this topic, but I strongly believe that the innovations in how money is created, how it is brought into use, and how it is used by the people generally are going to radically change how the world works. Money creation is no longer the exclusive privilege of central bankers and carefully licensed commercial and retail bankers. Essentially anyone can create a currency, and, if they are good at what they do, find a market where that currency is used to buy and sell.

Now that the ability to make money has been cut loose from the old ways, and now that open source encryption protocols are widely available, I believe it is very likely that trade and commerce is going to become increasingly hard to see. And by hard to see, I mean, hard for governments to detect and, therefore, tax or regulate. Free markets and free market money have the potential to reduce the ability of governments to steal from everyone.

Lunar Territories

Lyndon Johnson Preferred War Profits

Once upon a time, many years ago, I came across a graphic in a book that revealed something dramatic about the places where human beings had landed unmanned or manned vehicles on the surface of the Moon. If you want to truly understand the space age that began with *Sputnik* being launched in October 1957, you should have a look at this image:



In the original image, the red and blue lines were not present. I added those lines myself. They increase the clarity of the evidence presented: the Soviet Union and the United States staked out territories on the Moon.

If the space superpowers had no designs on claiming sovereign territory, it must be a stunning coincidence that not a single **Soviet** lander launched to the Moon from 13 February 1966 to 9 August 1976 landed within the pentagonal shape defined by *Surveyor 1*, *Surveyor 7*, *Apollo 11*, *Apollo 17*, and *Apollo 15*. An entirely related coincidence places not a single **American** lander from 28 July 1964 to 19 December 1972 was landed beyond the line defined by *Luna 9*, *Luna 2*, *Luna 21* and *Luna 16*.

Are there lander missions that defy this analysis? Not *Surveyor 2* which crash landed near the Copernicus crater. Not *Surveyor 4* which failed minutes before landing in the *Sinus Medii*, which takes its name from its position astride the equator and the Moon's prime meridian. The first 6 *Ranger* missions failed to reach the lunar surface.

Luna 1 flew past the Moon in 1959, as did *Luna 3* the same year. *Luna 4* flew past in 1963. *Luna 5* experienced a retro-rocket failure and crash landed in the Sea of Clouds. (Curiously, *Luna 5* is not listed among the accepted list of landing sites, presumably because it was not deliberately landed at its site.) *Luna 6* missed the Moon in 1965. *Luna 7* and *Luna 8* both experienced failures and crash landed in the Sea of Storms. (Again, curiously, *Lunas 7 & 8* aren't listed as landing sites.) It may be appropriate to assume that both *Luna 7* and *Luna 8* were targeted for the same landing area where *Luna 9* touched down in 1966. *Luna 10*, *11*, *12*, *14*, *15* were all orbiters. *Luna 18* was an orbiter which was deliberately braked to impact near the *Luna 16* landing site. *Luna 19* was an orbiter. *Luna 22* was an

orbiter.

The crashed remains of *Luna 5* in the Sea of Clouds represent the single territorial incursion of Soviet lander equipment inside the "American Pentagon" shown at right. To exclude this crash site would require connecting the landing sites for *Surveyor 1*, *Surveyor 3*, *Ranger 7*, and *Ranger 9*, then extending a pseudopod from *Ranger 9* to *Surveyor 7* and back to *Apollo 16*. Of course, we don't count shipwrecks on Earth for territorial claims.

Given the interesting pattern of landing sites on the Moon, it is surprising that both the US and the USSR signed the Outer Space Treaty in 1967. On the other hand, anticipating the negotiation of the Outer Space Treaty and having some uncertainty over whether it would be signed by the other party, it is not entirely surprising that the US and the USSR were each motivated to stake their claims to territorial sovereignty, as shown on the map.

It is my opinion and this view has been confirmed by private conversations with individuals involved, that the treaty negotiation team sent by the United States was ordered by the Johnson administration to give away all American territorial claims to all extra-terrestrial planetary surfaces, provided that the Soviets did likewise. It is an interesting aspect of world history that the various colonisation efforts by European countries in other parts of the world succeeded largely because they established in the new place some means for making permanent land claims to private property. It was the desire for land of their own that drove an enormous percentage of the emigration from Europe. (Please understand that I am not ignoring the native claims to the lands colonised by the Europeans. I am very unhappy about the use of all forms of coercion.)

Peaceful Pursuits

One of the obvious aspects of space settlement is that the territories being explored are not only devoid of native people, but nearly devoid of any life. Certainly the Moon and the asteroids seem to be entirely dead. Venus is so hot, and under so much atmospheric pressure, that robotic craft have difficulty lasting on its surface more than a few hours. It is very unlikely that any life is going to be found on Mercury or Venus.

The exploration and development of space, including its settlement by people looking for new homes and a bit of distance from corrupt and intrusive governments would seem to be a reasonable human activity. Had the American government persisted in what was evidently its national policy, it seems likely that permanent human settlements on the Moon, and under its surface, would be thriving today.

One can build a great many missiles to either launch death at enemy soldiers, or to launch people into space trajectories. One may see a wide variety of innovations driven either by death industries for war, or by space activities, or both.

Why then do you suppose Lyndon Johnson chose war? He very clearly wanted to end the expensive Apollo lunar programme before the end of his second full term in office. At the time he instructed the negotiators to the Outer Space Treaty, he fully contemplated running for re-election in 1968. President Johnson chose war, I believe, for two main reasons.

First, he and his family owned stock in certain companies that provided critical war materiel to the war in Vietnam, so he had the opportunity to profit enormously from a more heavily funded war effort. Second, he was almost certainly put in power in November 1963 by a *coup d'etat* orchestrated by Allen Dulles and using the resources of the Central Intelligence Agency, among others. The coup leaders wanted Johnson to expand the war in Vietnam in ways that it now seems evident president Kennedy would have been reluctant to do.

The Closing of Frontiers

I have written elsewhere extensively on my view that frontiers are vitally important to the human spirit. I also think that the people who believe in a managed society, who wish to be the managers of all the world, and who have effectively conspired since at least 1910 to act on their desire to have a world system under their control, are against having frontiers. Accordingly, there have been a series of treaties since 1957 closing off various frontiers: Antarctica, outer space, the sea floors, the sea surface. Nearly everywhere that people might go to get away from the authoritarian regimes owned and operated by the oligarchs has been placed on the forbidden list.

An excellent review of the value of a frontier to the human spirit was brought to my attention in 1993 by author, inventor, and engineer (PhD in nuclear engineering, 1992) Robert Zubrin. You might enjoy reading Dr. Zubrin's excellent books, including *The Case for Mars*. That excellent review was the doctoral dissertation of Frederick Jackson Turner at Harvard, and the title of his paper was “The Closing of the American Frontier.” You would probably benefit from reading it.

Whatever we come to believe, or prove, about the importance of a frontier for the human spirit, we can definitely say that within a generation of the closing of the American frontier a host of bad choices were taken. Truly horrible people who had in mind the domination of every human being on Earth, who had the impractical and now provably wrong view that a centrally managed society is possible, and who had the hubris and evil intention to be in control of all of that society, laid waste to important traditions, and then laid waste to the world.

One of the really interesting things that happened at the end of the 30 Years War in 1648 was the so-called “Peace of Westphalia.” In that treaty among the European powers, all of the countries involved – who had lost about 8 million casualties during the course of the war – consented to a number of restrictions on how and why they would make war. One of those restrictions was that none of the powers would be aggressors against any of the other powers. They would only go to war as a defensive measure.

In 1898, the ship *USS Maine* blew up in the harbour at Havana, Cuba. At the time, Cuba was a territory of the colonial empire of Spain. William Randolph Hearst, Joseph Pulitzer, and others evidently lied about and certainly exaggerated what was known about the explosion that destroyed the *Maine*. There is at least some evidence that it was not sunk by Spanish actions of any kind, and Spain denied the accusation at the time. Privately, Pulitzer believed that "nobody outside a lunatic asylum" really believed that Spain sanctioned the *Maine*'s destruction. Nevertheless, the Hearst and Pulitzer papers clamoured for war, and Americans fought and died in a war of conquest – conquering Spanish territories in Cuba, Puerto Rico, and the Philippines.

Making America an imperial power was not exceptionally successful. A series of revolts presented continuous reasons to deploy American troops in the Caribbean and the Far East. A very long series of wars and “police actions” resulted. At no time did the evil men and women running the country's largest defence contractor companies suffer the indignities of being shot to death on the front lines. So, from the perspective of a political success or a mercantile empire success, it may not have been exceptional, but for the profits of the war profiteers, it was excellent.

One could go on in this vein at some length, and I've done so in a number of other essays over the

years. You can also read thoroughly researched documents like G. Edward Griffin's *The Creature from Jekyll Island*, or Tim Weiner's *Legacy of Ashes*, or Jeffrey Rogers Hummel's *Emancipating Slaves and Enslaving Free Men*, or Tom diLorenzo's *Hamilton's Curse*, in order to gain some perspective on history. Why is it important to understand things that happened before October 1957? Remember the 4th dimension. Time is an aspect of the culture you live in.

Indeed, time may be entirely cultural, a sort of shared illusion, a social construct. However, people on Earth mostly seem to take it seriously, to live by it, to be "running every where at such a speed," to quote the Beatles. Schedules drive a great many things, and have been important in early space flights. Getting the timing right means understanding how things have gone in the past, and that involves an understanding of history.

There is another aspect of human history that you should take into consideration as you move about the universe. In 1495 the Holy Roman Empire's Reichstag at Worms declared that vendetta and blood feud were ended in all Christian lands. That edict was followed up by Martin Luther's bizarre and stilted reasoning asserting that God, through "Saint" Paul also known as Saul of Tarsus, in Romans 13 had declared that the authorities such as magistrates had power from God. In fact, "the authorities that exist" in Saul's time were the people generally, exercising their right to avenge wrongdoing by killing thieves, rapists, and murderers.

By ancient tradition, the next of kin of the victim acted as "goel" or redeemer of the victim. Some say "goel" means "avenger of blood." Various scriptures restricted the traditional role of the goel, requiring more than one witness to place a criminal in the hands of the goel. Nor is the practice especially Hebrew. Paying the blood price for a crime is an aspect of most traditional cultures.

It is simply not the case that a permanent judiciary, a permanent prosecutor, an established structure for administration of justice is needed. It is also clearly that case that where such an egregore has been established, the judges justify their existence by setting bailiffs and police to finding wrongdoers to fill the courts.

Prosecutors are compensated not based on finding truth, but on gaining convictions, and repeatedly we have seen prosecutors, government laboratories, and government agencies at all levels lying about the truth, falsifying evidence to gain convictions. The centralisation of justice has failed, and restoring judicial services to the free market, bringing back the role of goel is an important aspect of ending the state.

Frontiers: How Do They Work?

Explanations for Space Enthusiasts

What follows is an e-mail that I composed and distributed in January 1996. It should give you some sense of the attitudes and outlooks prominent at that time, as well as the long and rather tedious history of efforts to break free of the bonds of gravity and get off this crazy rock, which date back at least to the year 1610. I have elided some of what seems tedious, to me, at this point. The overall purpose of this chapter and the next is to make some comparisons (and demolish some others) between the future of mankind in space and the exploration and colonisation of North America by Europeans. An important ancillary purpose is to suggest that if you are looking for support in your efforts from existing space groups, you are probably looking in the wrong places.

To: Various space enthusiasts
Re: England and America

Dear Rick:

You wrote, "The one thing the last few years has taught us is that it is not the government or the people that open frontiers, but both. (and often unintentionally) It has also proven the extremists on both sides to be wrong."

Perhaps you have some examples you'd care to share. The currently ongoing government shutdown suggests to me that the so-called extremists who claim that we can survive without nearly as much government as we have seem to be right. With airfares dropping by 10%, and about 750,000 nosy bureaucrats out of work, I don't have anything to complain about.

You then note, "You cite Jefferson. Forgive my heresy, but in the quote cited he was wrong."

Well, of course you are a heretic, but not for suggesting Jefferson was wrong. He was certainly very wrong in holding slaves, in not settling his debts before his death, and, as a result, not being able to free them posthumously as he had promised. However, he did spend a trivial amount of money to more than double the size of America, spending a far less significant sum to have it scouted by several pathfinders, and encouraging large numbers of people to move way out West.

However, the quote I cited is not only pure Jefferson, it is one of his purist moments of truth. It is such a moment of gold, I'll quote it again for those who may have misplaced my earlier email.

> "**America was conquered, and her settlements made and firmly established, at the expense of individuals, and not of the British public. Their own blood was spilt in acquiring lands for their settlement, their own fortunes expended in making that settlement effectual. For themselves they fought, for themselves they conquered, and for themselves alone they have right to hold.** (*Summary View of the Rights of British America*, 1774, as quoted in *Papers 1:122*)"

A little further on, this bold statement is clarified, "**...no shilling was ever issued from the public treasures** [of the British crown for the assistance of the Americans] **till of very late times, after the colonies had become established on a firm and permanent footing.** (Ibid.)"

Now with regard to your examples:

"It was British government funds that led to some of the prime navigation tools needed to make the

voyage across the Atlantic,"

First of all, this example does not countervail in the least Jefferson's argument that America was conquered at the expense of individuals. He doesn't say America was reached thanks to the navigation tools of individuals, although that is largely the case.

Perhaps you are thinking of the Royal Greenwich Observatory which did help in the development of some of the key navigational instruments, including ephemeris, chronometers, and other tools. But that institution was founded in 1675 by King Charles II. From Jefferson's perspective, that must have seemed "**...of very late times...**" indeed, given the founding of Jamestown in 1607 , the founding of Massachusetts in 1620, etc. [Notes: People moved into the Americas at least 12,000 years ago. Vikings settled in Vinland about a thousand years ago; Columbus re-discovered America in 1492, and permanent European settlements were founded about that time. Harvard University was founded in 1636, almost 40 years before the Royal Greenwich Observatory.]

Just which "prime navigation tools" invented by researchers associated with the Royal Greenwich Observatory were "needed to make the voyage across the Atlantic"? These tools were certainly useful, making trade more efficient, but were they "needed to make the voyage" or just needed to make it faster?

With particular regard to chronometers, work begun by Robert Hooke in 1653 working with Robert Boyle led to Hooke's law, which as you know involves the elasticity of springs, and thus is essential for spring-driven chronometers. He did this work at Oxford, and further research is needed to determine if he was working under a government, private, or ecclesiastical grant. (I'll post results on this point soon.)

[Note: Well, I didn't post those results. Some recent research indicates that Hooke published a proof of Boyle's law before Boyle, and probably did his work on the spring constant and ship's clock while paid as a lecturer at Gresham College. No sign of government funds, even for the watch he gave King Charles II in 1658, which included an inscription claiming it would keep time properly through 1675, the very year the Royal Greenwich Observatory would be founded by that very King. It would seem we owe the opening of the frontiers to individuals, not to governments, after all.]

Hooke also developed a practical system of telegraphy in 1684, which in a later electrical variation proved to be very important to the development of the West. His chronometers were suspended by a universal joint which bears his name, and proved useful, though not especially suitable for shipboard use.

The 20,000 pound Sterling prize posted by the British Board of Longitude inspired another individual, John Harrison, to work for over 35 years on the subject of chronometers. Harrison was a carpenter who became a clock maker, and while his first working shipboard chronometer was tested successfully in 1728, he was not awarded the prize until 1762 with the advent of his 4th chronometer which was still too bulky for really practical use.

Now tell me, Rick, was Harrison the individual responsible for that invention, or was it the (governmental) British Board of Longitude that brought forth that invention? My position is that the prize money was certainly motivating, but was not the money which paid for the work. Jefferson's position would clearly be that this chronometer was "**...of very late times...**" and the money spent in 1762 by the British Board of Longitude, if that was indeed public money, was spent long "**after the colonies had become established on a firm and permanent footing.**"

So what prime navigation tools were you referring to? The ones Columbus used to navigate with in

1492? These were clearly not paid for by British public monies.

Your next example: "British troops (Leading local militia in many cases) who kept us from becoming French subjects (and inadvertently training the leaders who would then defeat them...an interesting parallel to our cause),"

Now, having just spent a week in Paris in September, I can concur that I am much relieved that I'm not a French citizen. (By the way, citizens are literally denizens of a city, but the term connotes the population of a republic, such as the contemporary French Republic. Subjects would be the population of a kingdom, as in "Subjects of His Majesty George III." If the British troops hadn't been around, we would not be "French subjects," in my opinion, just as we are not today British subjects.)

However, let us ask Thomas Jefferson about those British troops which kept us from becoming French subjects. He would note that the seminal conflict, 1754 to 1763 was, "**...of very late times...**" given that he was writing his *Summary View* in 1774. He would also, a year later, be quite vexed about those British troops who decided to seize the arms of the Massachusetts farmers (who had, you'll agree, a natural and inalienable right to keep and bear arms).

Those same British troops were posted to keep the American colonists from violating the terms of the 1763 treaty which provided protection to the Indian nations who were allied with Britain from any colonists settling West of the Appalachians. Now, does that constitute government funds being expended to help " **...America** [be] **conquered, and her settlements made and firmly established**" or does it constitute hindrance? Any review of Jefferson's writing on the subject would reveal that he would have concluded “hindrance.”

Those same British troops were used to enforce the Stamp Act, the Tea Tax, the Townshend Acts...do I need to go on? Are you really suggesting that those British troops were anywhere to be found in 1607 or 1620 or 1650 or 1675? Out there pounding the turf, protecting those settlers from Indian attacks? Hell no. Busy in Britain or India is more like it. [Note: The British East India Company established its first trading post in India in 1613, and other significant posts on the Subcontinent throughout the 17th Century.]

Shall we talk about frontier forts? You recently wrote an essay claiming that governments went out onto the frontier and built forts, around which traders and settlers congregated. Know any really old forts on the North American continent? Perhaps you would name Fort Ticonderoga. That was founded by the French as Fort Carillon in 1755, long, long after the region had been thoroughly explored by traders and settled by farmers. [Note: Military fortifications are generally built to protect something of value, such as a trade route or a resource base. Things don't have value unless there are people around to create value.]

Was there a fort on the beach head at Plymouth? No, there was a rock.

Was there a fort on the James River near Jamestown? Curiously, there was, built by the settlers at the expense of the London Company. It was men of the London Company who manned it and men of the London Company who died there. British government troops didn't arrive in Virginia until much later, long after an individual named John Rolfe first cultivated tobacco there. (Rolfe went on to marry Pocahontas in 1614; you may have seen the cartoon, but you should certainly read the book.) You see it was the tobacco which made Virginia worth keeping, and it was an individual who came up with this idea of cultivating tobacco in large farms in Virginia.

But, the London Company? Yes, Virginia, there was a London Company, composed of stockholders living in and about London. Sounds like individuals to me. If it sounds like a government agency to

you, you are very misinformed. Socialism wasn't even invented until 1848, and wasn't popular in the USA until the 1930s.

So we then come to your greatest example, "and City of London management of the banking, insurance and trade industries that kept things stable enough for the founders of the East India and Hudson's Bay companies to create profits."

Whoa, Nelly! Check your sources and cool your jets. I'm pretty sure the British East India Company didn't do much conquering or settling in America. They did all their work in India and the Far East. Of course, they had a few British naval vessels to call on for back up, but they also had several large fleets of their own. Perhaps you are referring to the profits that the British East India Company garnered by the enforcement of the Navigation and Tea Acts which prevented British Americans from getting tea from anyone but the British East India monopolists? Of course, public monies were spent in keeping the Americans drinking that East India tea, but I doubt if Jefferson was very enthusiastic.

Go get the figures on the British East India Company. It didn't become profitable until long after America was settled. Indeed, it was founded in 1600, for the purpose of breaking the Dutch monopoly on Eastern trade, but it didn't become profitable until 1708, mostly because the Dutch fought back. Vigorously.

What of the Hudson's Bay Company? Ian Randall Strock can tell us much more about the history of the Hudson's Bay Company. It was founded in 1670 and was hugely profitable by 1672, so I hardly think the intervention of the City of London was significant in its success. Rather, its success was guaranteed by a government-decreed monopoly on the fur trade.

However, I'm quite sure the Hudson's Bay Comapny did its work in Canada, mostly around the Hudson's Bay area. That is the great big huge bay that sticks into central Canada. Checking a map, we can readily see that Hudson's Bay is nowhere near the Massachusetts, Virginia, New Hampshire, or even Pennsylvania colonies. So Jefferson, while impressed by their exploits, was probably not referring to them in his *Summary View*.

Did the Hudson's Bay Company conquer America? Sure did. Kicked some Royal French butt. Did they settle America? Sure did. Several cold cities in the northern Canada frontier owe their existence to the Company, including one that has a nice little rocket range (Churchill). Was it public monies they expended? Nope. It was the money of "gentlemen adventurers" as their charter so boldly states.

What would Jefferson have said about the Hudson's Bay Company in reference to his claim that individuals conquered America, settled her shores, and bled for the right to claim the land? He would have pointed to them as prime examples of what he meant.

Dr. Robert Zubrin has added ample historical research to the case against government settlement or even exploration of frontiers. In describing the various British naval expeditions to find the Northwest Passage, he has pointed out that many of these great ventures expended huge amounts of capital, sent hundreds of men to their deaths on ill-stocked ships, and found nothing but ice.

How was the Northwest Passage found? Not in 1719 by James Knight in association with the Hudson's Bay Company, but in much more modern times ["**...very late times...**," 1903-06] by Roald Amundsen. Did Amundsen have hundreds of men, dozens of British Naval vessels, or tons of salt pork to feed his crew? No. He had a tiny ship (the *Gjoa*) built for a crew of 6, loaded mostly with ammunition for the rifles with which he and his men killed dozens of caribou along the way as they explored the region.

Spending hundreds of thousands of British pounds in the 1700s and 1800s is roughly the equivalent of spending billions on a Federal boondoggle today, especially if you factor inflation into the picture [As

brought to you by the Federal Reserve scheme.] And one naughty Norwegian in a little boat with a half dozen friends finds the Northwest Passage without spending any British crown treasure. Hmmm. Add to that the hundreds of British sailors who died of starvation on ice-bound naval vessels because their bureaucracy-bound leadership was too stupid to suggest they go kill some caribou, and you have some idea of my picture of the modern American space program.

You also wrote, "The line between government and business in those days was almost non-existant [sic] at the top levels and many of the gentlemen involved held seats in Parliament."

Oh, golly, that is so far out of line it is ludicrous. The line between government and business was incredibly well defined. In those days, there was hardly any government at all. By those days, I'm sure you mean the days Thomas Jefferson was talking about in the quote you suggest is false to fact. Those days would be the days from 1607 until 1690 when Jefferson's America was being conquered, settled, and tamed.

In those days, the government was mostly the King, except for a brief period when Cromwell and his boys were playing holier than thou Protectors. As far as Parliament, are we talking about the Parliaments dissolved by Charles I, Charles II, and James II, or the Rump Parliament dissolved by Cromwell? Just what was Parliament, more notable for its dissolutions than its sessions, doing in those days? In 1651 they passed the Navigation Act which led to some nice wars with the Dutch, but that did nothing to help conquer America.

Of course, defeating the Dutch during that time did deprive the American colonists of competitively priced European goods and helped support a British monopoly on American trade. It did cause a beautiful city named New Amsterdam to become a monstrous eyesore called New York. It seems clear that America was developed and settled **in spite of** the Acts of Parliament and not because of them.

You then note, "Oh, by the way....Jefferson so hated government that he went on to help found one of the most powerful ones on Earth."

Curious you should mention that, since Jefferson was a classical Whig before forming the Democratic Republican party. Jefferson despised the pro-government views of the Tories, even after the Revolution and the Constitution. He wrote to James Madison in 1826 that the Tory views of Blackstone were so appalling that they had to be kept from the law library at the University of Virginia.

Jefferson, who so hated powerful governments, wrote the Virginia and Kentucky Resolutions, which argue fervently (and well) for the concept of nullification, wherein local governments of states can eliminate the encroachments of the big national centralized government.

Jefferson helped found a very small government, and was President of it at a time when it had three Executive Departments, being War, Treasury, and State. He did not preside over a government with a department for Education, another for Energy, another for Veterans....

No, Jefferson favored small government. As do I, by the way. As Thoreau once said, "**...to speak practically...unlike those who call themselves no-government men, I ask for, not at once no government, but at once a better government. Let every man make known what kind of government would command his respect, and that will be one step toward obtaining it** (*Civil Disobedience*, 1848)."

Taking him at his word, I will say that the kind of government that would command my respect would be much more like the government over which Thomas Jefferson presided. I can have no respect for governments which legislate morality, such as that at large in this land today.

Do you respect a government that violates civil liberties in pursuit of a chimera called the "War on Drugs" and shoots people in Idaho who don't pay the fees needed to sell sawed off shotguns, and burns people to death in Waco for not having obtained Federal firearms permits, and forced states to force people to obey a 55 mph speed limit for 20 years, and has a regulation for every conceivable use of private property, and has a law against everything from sedition to the transport of cash money legally earned across its frontiers?

Tell me how much you respect a government that thought the best way to get people into space was on a vehicle like the *Challenger*. Tell me how much you respect a government that has spent over $9 billion and over a decade building a space station that isn't habitable yet. Tell me how much you respect a government that spent billions putting men on the Moon and then pissed away all that momentum so that from 1975 to 1981 not one American flew in space.

Tell me how much you respect that government, and I'll tell you how much I want to change it.

You note, "We need the end to pull the center."

Sure we do. It was Barry Goldwater who said that extremism in the defense of liberty is no vice. He also noted that moderation in the pursuit of justice is no virtue. I am not one of the middle-ground-seeking compromisers who dwell in the foggy bottomland of the District of Columbia. Nor will I crawl on my belly in the dirt that surrounds them while begging favors. If others think they accomplish anything by doing so, my condolences to them for the death of their dignity, and of the respect of those who have to watch the process.

You conclude, "It is in the careful manipulation of both that we shall reach our goals (Note Jerry's work on DC-X)."

Jerry Pournelle did excellent work on DC-X. Everything the DC-X accomplished it did in spite of the great huge government agency that you (and apparently Jerry) want to support in building a space station. The creation of the DC-X program was opposed by NASA. It was unfunded by NASA until they had thoroughly jeopardized its existence.

And the genius of that program was that it let private industry work without much interference, design kibbitzing, or paperwork. That allowed McDonnell Douglas to bring in people from the commercial aircraft side of the company who knew something about making things work quickly, cheaply, and profitably.

The kind of a government that would command my respect is the kind of a government that would have _ALL_ of the space activities in this country carried out in the fashion and with the intentions of the DC-X program. Such a government would help research and development activities that could lead to commercially successful products and services that would be owned and operated by private companies.

However, I don't think we have much chance of creating such a government. Certainly, I cannot agree that building the space station represents the correct path.

When space station was first proposed, it was proposed in spite of all the efforts of Jerry Pournelle and hundreds of guys like me who wrote their Congresscritters and called the White House and sent telegrams in 1983. You remember those heady days? We wanted Reagan to announce plans for a lunar base! Weren't we kidding ourselves then.

Space station was the compromise between no new announcement and a space station plus a lunar base. Like all compromises, it was the worst of all possible options. But even then, had it been built for

$8 billion and within a decade as requested, it might have been a useful thing. But here it is 1996, over $9 billion spent, and no space station.

What we have had instead of a space station has been a program to employ thousands of engineers and spend billions of dollars. Which is cool if you are an engineer or an aerospace company, unless you'd rather be an engineer working on a project that is going somewhere or an aerospace company that is making hundreds of billions exploiting a new frontier.

The only people who truly seem to benefit from this condition are the politicians who get to say, "See, I helped fight for the space station." So they get campaign contributions from aerospace companies and they get re-elected. Which is about the height of their ambition.

What of those of us who want to see the other side of the galaxy? What of those who wish to live on the Moon or Mars? Do you suppose this government commands the respect of such people? No, of course not.

Anyone who even wants to fly in space just once in their lives must be disgusted with the NASA approach to spaceflight. The shuttle cargo bay holds 35,000 pounds and has never once been used to carry passengers to orbit. The envisioned space station will have room for how many dozen astronauts (and cosmonauts)? What's that you say? About four? Gee.

Does that mean that my chances of flying in space are about the same as my chances of spitting in Bill Clinton's eye from 1400 miles away? Yup. Do I feel ripped off and cheated because I spent 14 years fighting for the government's preferred space program with letters to Congress, fundraising events, campaign contributions, a large circulation newsletter that I personally underwrote, years of organization work building and rebuilding a Texas telephone tree, and thousands of manhours of labor? You bet.

I admit that I wasted 14 years trying to reform NASA. When I figured out in 1991 that I had wasted 5 years trying to reform the National Space Society, I began to draw lessons and parallels. So by 1993, I knew that trying to reform NASA was like pissing up a rope, only one doesn't even get a warm wet feeling between one's legs. Since then I have been doing everything I can to destroy NASA.

Truly, it must be destroyed if anyone reading this post is going to fly in space. Ever. In a thousand years. As it exists today, NASA prevents private enterprise from opening the space frontier. As it exists today, NASA prevents people like you and me from ever flying in space. NASA learned the wrong lesson in 1986. It wasn't the schoolteacher who brought down *Challenger*, it was the schoolteacher whose death kept the shuttle program alive.

If she hadn't been on that flight, the shuttle would probably have been cancelled, as well it should. Instead, the damned thing continues like a once-killed vampire. And it is ordinary people like that schoolteacher who truly want to journey through and settle in space who will one day lay that vampire to rest. [Perhaps to atone for flying Senator Glenn, NASA agreed to fly teacher-in-space backup Barbara Morgan. She would eventually fly in 2007, after yet another seven astronauts were incinerated due to NASA incompetence.]

Or not. When Sirius goes nova and inundates this region of space with so much hard radiation that life as we know it ceases on this planet; when the Sun goes into its death throes and evaporates what's left of Earth; at that far distant date no humans will be around to suffer because of it. For one of two reasons.

Either humans will be busy colonizing distant parts of the galaxy, or humans will be an extinct race long forgotten, whose steel and concrete monuments have long since washed into the sea. That is all

which is at stake. Nothing as important as screwing the taxpayer out of another few billion dollars. Nothing as useful as winning the next election.

Only everything, and nothing more.

Occasional essays on significant topics from the Iconoclast's perspective.

Goring sacred oxen is my specialty.

Criteria in ***Space***

The essay which follows attempts to develop a set of necessary, sufficient, and desirable criteria for the goal of opening the space frontier. Other attempts in this vein seem to have been trivialized by dogma and political claptrap.

A certain organization has made much of its so-called "Frontier Enabling Test." Yet this organization has apparently used this test to justify its support for everything from the international space station program to various multi-billion dollar efforts evincing a design to limit further the competition for space transportation services. Certainly, trusting any one organization, not built on the most principled of foundations, to determine and apply criteria for opening the space frontier is a speculative proposition at this time. Until the frontier is open, we should seek a multiplicity of approaches; no one true path has been anointed. In all likelihood, when the frontier is open we will look back and note that a variety of endeavors and factors were essential to its conquest.

In analyzing the criteria for meeting the goal of opening the space frontier, we should examine three categories: necessary conditions, being those conditions which are essential for the objective; sufficient conditions, being those which, once met, should soon see the frontier open; and desirable or preferred conditions, being those conditions which not only enhance the opening of the frontier in terms of speed or robustness, but also tend to enhance other aspects of life.

Cheap access to space (CATS), for all that it has been trumpeted as the *cause celebre* of the space movement, is a desirable condition. It is neither necessary nor sufficient for opening the space frontier. Just as access to the New World was once quite dear in terms of treasure, space may remain out of reach for many purses for some time. In the face of expensive access to space, we have seen thousands of satellites launched to orbit, doing yeoman's work in a host of industries. The supply of space transportation is not the only, nor is it even the most essential condition to be addressed. Given adequate economic incentives, the space frontier will be opened even in the face of expensive access costs. Traditionally, the opening of a new frontier drives down the cost of access to that frontier, not the other way around.

If the much vaunted "CATS" is not a necessary or sufficient condition, what criteria might we more profitably examine? What follows is an analysis of five conditions, each expressed as a necessary, as a sufficient, and as a preferred condition.

Necessary Conditions

1. Markets for space activities must exist.
2. Mechanisms for *de facto* property acquisition must exist.
3. Government involvement (if any) must be consistent and reasonably predictable.
4. Investor confidence in the space frontier market must exist.
5. Economic motives for space development must be acceptable.

Markets

Markets for space activities do exist, especially in telecommunications. Unfortunately, in Earth remote sensing, weather observation, technology demonstration, and space environment research, significant markets are stifled by government involvement. Each of these markets represents a significant opportunity for private enterprise, and each is being distorted in the most detrimental ways imaginable by governments bent on control. Privatizing and commercializing these markets is necessary to their healthy development. Previous efforts to do so have been perfunctory at best, and have tended in most instances to perpetuate the monopolistic influence of bad government.

Communications satellites represent an expanding market. As the geosynchronous orbit becomes increasingly crowded, greater interest has been focused recently on the opportunities for constellations of low Earth orbit communications satellites. A very large number of competitors each operating a major network of dozens of satellites is a near term probability, with the Iridium constellation and others beginning to be launched.

The market for space tourism is also very large. In the United States, this market has again been dominated by government intervention. An effort by this author to establish a space travel service company was thoroughly demolished on orders of the National Space Council. Space tourism on the US Space Shuttle has been negligible, limited to junketing Senators and Congressmen, foreign princes and dignitaries, and the occasional schoolteacher.

Expressed as a sufficient condition, the markets for space activities must exceed a certain level, perhaps $500 billion to $1 trillion per year, in order to sustain a high level of interest in opening the space frontier to economic activity. Additional research into the real level of in-space activity and the extent of markets therefor is needed in order to establish the precise definition of this sufficient condition.

As a preferred condition, markets should be extremely large. The greater the market for space activities, the more likely the frontier will be opened in a sustained fashion. The early market for Spanish access to the New World revolved around government explorations, land grants for minor nobility and government functionaries, the enslavement of the native populations for agriculture and mining, and the extraction of gold and silver to pay off Spain's war debts to the Rothschilds and other banking interests. A far more sustainable English approach to the new frontier is to be found in New England and Virginia, where cash crops, shipping, timber, and the triangle trade created a lasting economy.

Whereas the Spanish approach has produced a number of recently developing nations, it led to no great prominence for either Spain or the nations arising from its colonial territories. The Spanish approach was barely adequate to opening the frontier, but not effective at creating economic opportunity. Ultimately, this failure led to the demise of Spain as a world power and to much of the internal chaos which has dominated the successors to its colonies.

England, on the other hand, remains one of the great world powers, to this day. While its Empire has faltered and been sold down the river, it remains a dominant force. England, aka Great Britain, has a world class navy, a nuclear force, and a veto on the United Nations Security Council.

Two of its New World colonies are also very prominent on the world stage. Both the United States and Canada are significant world powers, with the US having a dominant navy, nuclear forces to rival any comers, and a veto on the UN Security Council. By any measure, England and the successor nations to her colonies are triumphant on the world stage. Even Jamaica stands head and shoulders above her Spanish counterparts in the Caribbean, making Cuba look like a booger.

It would be a grievous error to take the Spanish approach to opening the space frontier. More than

likely, given the absence of native populations to enslave, that approach is untenable from the word "go." A market-based approach is quite possibly the only feasible way to open the space frontier.

Property Rights

It is necessary for *de facto* property acquisition to exist in order for any frontier to be open. While the ownership of spacecraft launched from Earth is not in doubt under the present regime, there is no governing authority for the acquisition of space resources as private property. While that is not a preventive factor, it is also not a motivator. Investors have expressed doubt about ventures that involve exploring or acquiring the Moon, Mars, the asteroids and other planetary bodies precisely because they are concerned about the practical methods for acquiring and maintaining ownership of these resources.

Accordingly, the only significant market for space activities which has thus far been developed is one which depends only on the ownership of spacecraft in Earth orbit. Recent events have demonstrated that water and other essential resources are available on the Moon and on Mars in plentiful abundance. Already, we have demonstrated (circa 1969) the technological means necessary to establish human operations on the surface of the Moon. Any number of conceptual proofs for establishing human activities on Mars have been established in considerable detail.

Therefore, it only remains to demonstrate that people can go to the Moon or Mars and acquire property thereon. The economics of the situation will then take over, and the frontier will spring open, releasing the flood waters of colonization.

To express this condition in its sufficient form, enough people must be satisfied by and enthusiastic about exploiting the availability of *de facto* property rights. Whether a sufficient number of people is a few thousand or a few million, at the present time essentially no one is satisfied with the prospect of obtaining property on any celestial body. Accordingly, it may require dismantling the 1967 Outer Space Treaty to fulfill this condition to its sufficiency.

As a matter of preference, property rights in space should be ubiquitous. There should be no more question about buying and selling real estate on the Moon than there is here on Earth. Ownership should be available in perpetuity, with no process of eminent domain for any purpose.

Consistent Government Policy

The bane of the space industry is government. When government changes its dictates, markets collapse, companies dissolve, and everyone looks around for a way to get beyond the new hurdles. Government is bad enough; inconsistent government policy is a nightmare for business.

For example, Orbital Sciences Corporation was founded with the idea that a *Transfer Orbit Stage* to take communications satellites from shuttle orbit altitude out to geosynchronous would be useful to a number of customers. The same stage could also be used to propel a number of spacecraft to other orbits, as well.

Then the *Challenger* exploded, proving NASA's ineptitude, negligence, and willful disregard for human life. President Reagan recognized that the shuttle was inadequate, and a two-plus year stand down was put into effect. Orders for the *Transfer Orbit Stage* never materialized. Subsequently, President Reagan took the important step of banning commercial satellites from the shuttle. Suddenly, the market for the *Transfer Orbit Stage* evaporated, too.

Orbital Sciences cast about for other markets. They examined small satellite systems for communications and other applications, correctly anticipating a major market trend. When they found that the available launchers for small satellites made some of the economics doubtful, they set about to build the *Pegasus* launch vehicle.

By converting the *Transfer Orbit Stage* to work with the Titan launch vehicle, Orbital Sciences salvaged some of that business opportunity. After their success with the first *Pegasus* launch, they went public. Getting into launch services in a big way, they acquired the suborbital launch services company Space Data.

Other companies dependent on the shuttle for launch services shifted their business to Arianespace. Suddenly, the Ariane was carrying more than half the world's commercial satellites into orbit. Market dominance shifted permanently away from the United States, due in large part to the original, inept shuttle policy. Making the shuttle the only US launch vehicle, shutting down the expendable launch vehicle production lines, and sabotaging the efforts of Truax, Hudson, Hannah, and other space transportation entrepreneurs was NASA's idea of a good approach. NASA proved its policy failure with *Challenger* and the aftermath thereof. The loss to American industry is measured in billions of dollars.

Therefore, it is necessary that government involvement in the space arena be consistent. Whatever obstacles that governments place in the way of industry will be bounced over and around. As Thoreau notes in *Civil Disobedience*, "Trade and commerce, if they were not made of India rubber, would never manage to bounce over the obstacles which legislators are continually putting in their way; and, if one were to judge these men wholly by the effects of their actions, and not partly by their intentions, they would deserve to be classed and punished with those mischievous persons who put obstructions on the railroads."

The problem arises, and is magnified in an emerging industry, when the government moves the obstacles around too frequently. In America, that seems to be the case every two years or less as Congress shifts about its political winds, blowing ill fortune wherever it turns.

The above essay and the previous chapter were, as noted, meant to convey something of the history of the space settlement movement. They are also intended as an overview of how frontiers matter, and how the space frontier has not been opened in the ways that the New World was opened to settlement by Europeans.

You can see some of the people involved named individually, and others by reference to their organisations. You may also have noticed that I had not yet adopted Confederate or international British spelling conventions in my writing style. That would come later as I became increasingly vexed with those damned Yankees and their Mordor on the Potomac government.

It is not my opinion that you are going to get effective and enthusiastic space frontiersmen from the existing space “activist” community. A great many of the people in those groups are dedicated to finding government subsidies for space projects, and are either unwilling to consider private alternatives, or actively opposed to any non-governmental space activities. A few who claim to represent a new way of doing things, New Space, as it were, are only interested in government subsidies whenever it seems expedient. Which is, of course, quite often.

If you weren't as interested in these chapters as in some of the prior material, let's move on to a discussion of human interest. Let's talk about sex, childhood, and murder on the space frontier.

Sex, Childhood, and Murder on the Space Frontier

The Lesson of Virginia Dare

Prior to the war of the Spanish Armada in 1588, a gentleman named Sir Walter Raleigh, with the Queen's approval, organised a colony that was sent to Virginia (named after that very same Queen) and called “Roanoke.” The very first colonists from England included a couple who had a child, Virginia Dare, 18 August 1587. We don't know a great deal about her life, because her grandfather, John White, the governor of the colony, returned to England a little later on in 1587 to fetch supplies and additional colonists. Owing to the hostilities with Spain, he did not return until 3 years later, by which time the colonists had disappeared.

I mention these points because it is fairly clear from the number and composition of crews as well as the length of time men and women have been in space together and the rather obvious strategems and locations for such activities that people have had sex in space. If you don't believe it has happened, you are free to persist in that belief, I shall not seek to persuade you.

Something that has not happened is: no human being has been born beyond Earth's atmosphere. It is an interesting question what it would be like giving birth in microgravity. Perhaps a space scout will find out. It is another interesting question: can humans conceive beyond the orbit of the Moon?

It is a well known circumstance that women experience a menstrual period that is aligned with the periodicity of the Moon. Many women ovulate at one phase of the Moon and menstruate at another phase, fairly consistently, month after month. The Moon is also responsible for the majority of tidal forces felt in Earth's oceans. The Sun, and to a much lesser extent, Jupiter and the other gas giant planets, exert the balance of those forces.

We know of a large number of organisms on Earth that do not travel well. A similar environment provided to them does not result in consistent bearing of young. Some species are incapable of living, let alone reproducing, far from their peculiar environment. Transplanting them simply kills them.

Thus, it is not an idle question whether the Earth's influence on the Moon would be adequate for the purpose of maintaining the fertility cycle of humans. It is not a settled matter whether humans would be able to conceive children on Mars. Nor, of course, is it a settled matter whether humans are forever going to age, become frail, and die within about 120 years of birth. Many things are possible.

Whether youngsters are brought into space by their parents, or born on the space frontier, it seems very likely that people are going to raise children in space. A host of additional questions seem relevant. What of the conditions that Earth children experience are essential for healthy development of the human body?

Is a one-gravity field the best environment for children to grow in? Would they be okay at the slightly lower influence of gravity in a high altitude atmospheric platform containing a city in the sky? (One would think it most likely, yes.) Would they develop normally in the one-sixth gravity of the Moon? How about the one-third gravity of Mars?

We live on a planet that is fully alive. When we look around, in the frozen tundra, under the ice caps, deep in the sea, in volcanic sea vents where the continental plates are separating, in sulfuric pools in remote places, we seem to find life, life, and more life. Some of it very weird, to be sure. But life is everywhere.

How much life would we need to bring with us to have a healthy ecosystem on the Moon? I have no idea. To my knowledge, nobody has transported even a small farm into space. Efforts, such as Biosphere II, to create an isolated environment with living quarters for a few humans have not met with much success. It appears that a full-scale ecology capable of sustaining human life for decades, not to mention generations, may be a complex undertaking.

In other words, it may be easy to scout the space frontier, and considerably more difficult to settle it. I very strongly believe that mankind will settle our Solar System and reach for nearby stars. When does that happen? I'm not sure. Until then, children raised in space are going to have some very interesting and very unusual experiences.

Murder

By now you're probably asking yourself, okay, sex, childhood, what about murder? Other than the possibility that the Roanoke colonists were killed by hostile natives, or that they murdered one another as supplies became low and the anticipated re-supply ship failed to return, we don't have a good sense of when the first English colonist in North America was murdered.

There are stories from the Viking sagas that suggest quite a lot of murder and mayhem occurred in their adventures in North America. But, of course, the very first person to visit “the New World” was no sort of European. Instead, they were most likely of Asian origins, coming over the land bridge where the Bering Sea now is, perhaps as early as 15,0000 years ago. And, people being what they are, it was probably one of those very early humans who was the first murder victim in North America.

I wish to note at this point that there is at least some evidence, both in the genetic records of native peoples from the region, and in archaeological evidence, that people from the Mediterranean, possibly Minoans, visited the Great Lakes region and mined copper there perhaps 4,000 years ago. To say that what we know of our history is extremely limited, to lament the burning of the library at Alexandria or the Mongols dumping the libraries of the House of Wisdom into the Tigris and Euphrates at the sacking of Baghdad is to merely hint at the vast wealth of knowledge and information that people have lost access to during the course of recorded history. How many other libraries of knowledge were lost when the sea levels rose at the end of the last Ice Age? We may never know.

Murder is a possible event in space. Although there was a brutal fork fight, on Salyut Six space station if I have the recollection correct, there has not been a murder so far. The seven astronauts killed on *Columbia* and the seven killed when their crew capsule hit the water after the *Challenger* disaster were clearly killed by negligent homicide, but not by pre-meditation.

My purpose in bringing up the topic is to suggest that human activities are consistent throughout human history. People have sex. They get born. They have childhoods. They mature, and have sex. They have families. They have hopes, dreams, and aspirations. And some percentage of them, by some accounts perhaps around 1.8% commit violent crimes. Some day, there will be a murder on the space frontier. Perhaps a future novelist will write a Truman Capote “true fiction” extravaganza relating those events, after they have happened.

People are born, grow up, age, pass away. That's been true of every environment we've encountered. It is going to be true in space.

Space Activists, Science Fiction Fans

The Secret Masters of Fandom

There are a number of groups that have been organised over the years in support of the ideas found in books of science fiction dating back well before the 19th Century. I believe that some of these science fiction fans are still interested in going out into space. However, after my days and evenings at the World Science Fiction convention in Kansas City in August 2016, it seems to me that there aren't as many as before. Or, perhaps, they don't attend WorldCon the way they once did.

Before we get to far into the topic of fan groups, I'd like to take a bit of time to encourage you space scouts to read science fiction. As early as 1865, Jules Verne wrote a popular novel, *From Earth to the Moon* in which he discussed the possibility of humans visiting the space frontier. It is available for free courtesy of the excellent people at Project Gutenberg, and is a work now firmly in the public domain.

There are many other pioneering works in this respect, including early stories of time travel, of major disasters, of alien invasions, of large space structures, and of cataclysmic disasters that re-shape Earth. It would be a useful way to spend some of your free time when you aren't training vigorously to learn new skills or practicing your existing skills.

For my part, I would urge you to avoid much of the socialistic and “managed society” branches of science fiction. HG Wells would be an author very firmly in this camp, who felt that the destruction of contemporary society for the purpose of “bettering” the human race was an ideal to strive toward. He was certainly talented, and time spent with *The Time Machine* or *The War of the Worlds* would not be wasted.

Much more worthwhile are works by Robert Heinlein, Larry Niven, Jerry Pournelle, Greg Benford, James P. Hogan, L. Neil Smith, the agorism novelisation *Alongside Night* by J. Neil Schulman, Robert Forward, Michael Flynn, Ben Bova, Poul Anderson, H. Beam Piper, William Gibson, Neal Stephenson, and many others. You would do well to read their books with an eye toward understanding how the space frontier has been perceived, to see how the parallel universe theories of John Wheeler were integrated into conemporary fiction by Neil Smith, Jim Hogan, and Neal Stephenson, among others, and how people have survived dramatic changes to civilisation, including calamities like asteroid strikes.

If I had to narrow the scope of my recommendations to only a few novels, I would probably select:

Anathem by Neal Stephenson

Neuromancer and sequels by William Gibson

The Moon Is a Harsh Mistress by Robert Heinlein

Lucifer's Hammer by Larry Niven and Jerry Pournelle

Footfall by Larry Niven and Jerry Pournelle

Stranger in a Strange Land by Robert Heinlein

The Probability Broach by L. Neil Smith

Paths to Otherwhere by James P. Hogan

Depending on which of these titles strikes a chord with you, there are many others in like vein on every topic. For example, one of the most interesting series on the topic of alternate universes is the *Nine*

Princes in Amber series by Roger Zelazny. Many excellent examinations of different periods in history involve time travel to parallel universes (or, as seems to be closer to the case, parallel narrative threads in time). Dean Ing, Brad Linaweaver, and L. Neil Smith have done excellent work in this area. A more linear look at time travel is found in various excellent novels by Poul Anderson, including *The Shield of Time*. Eric Flint's *1632* is an excellent look at time travel to an important period in history by a large group of travellers.

Ben Bova, David Brin, and Michael Flynn have done excellent work examining the early days of human settlement of space, as they might yet be. I'm also very fond of Kathryn Graham's *Flight from Eden*. The fiction of Paul Rosenberg, especially *A Lodging of Wayfaring Men*, and *The Breaking Dawn* should be included in this overview. Mostly, though, speculative fiction has a place in thinking about the future and, therefore, being ready for whatever comes.

The truth is, nobody really knows what the future will bring. Every once in a while, someone like L. Neil Smith predicting the Internet and the digital watch in his first novel seems incredibly prescient. And then one reads about huge rolling high speed beltways or nuclear fuels being used to fly rocketships beyond Earth in Robert Heinlein, who is otherwise quite excellent at predicting important trends in human activities, and you smile just a bit.

Many of the early space pioneers were enthusiasts of science fiction. Some of the people I've met in the aerospace businesses I've worked with and known personally found science fiction to be inspiring to them. I think the Apollo space programme would have had about a tenth as many engineers working on it if it had not been for Robert Heinlein, John W. Campbell, and other writers of their era. Similarly, without visionary writers like Konstantin Tsiolkovsky and Hermann Oberth, neither the Russian nor the German space and missile programmes would have gone nearly as far as they did.

However, as I have pointed out in previous chapters, there is only some evidence that space activist groups have been good for much but clamouring for bigger government space expenditures. There are many individual exceptions to this general rule, in terms of individual space activists. But if you are seeking organisational support for your personal effort to build a launch system and reach Earth orbit, I suspect you would do well to look beyond the space activist community.

Other than the Libertarian Futurist Society, and a few other futurist organisations, including the various off-shoots of the Extropian discussion lists of the 1980s, I don't think you are going to find much active support in the formal science fiction fan communities, either. It might profit you to visit one or two local conventions, especially ones in Los Angeles, Chicago, Atlanta, or Boston – places where conventions have been very successful over a great many years. Atlanta in particular has DragonCon, and Chicago and LA have both hosted multiple World Science Fiction conventions. Nevertheless, besides finding people who are interested in talk, I would expect you'd have more luck in the general population, or at a film festival featuring science fiction films rather than amongst the remains of the SF community.

No overview of science fiction would be complete without briefly mentioning the “secret master of fandom” or SMOF. The people who are actually effective at putting on conventions are really good at several important skills. SMOFs make lists, keeping track of many variables. SMOFs avoid spending money when a volunteer can be found, or when a company is willing to donate something. SMOFs coordinate with hotels, travel agencies, guest speakers, musicians, costumers, food providers, and many others in order to bring off a science fiction convention. The really good ones are either found in the cities above, or have attended more than one convention in those four cities and learned from the best.

Given the practical aspects of building your own path to orbit, and on to the various planets, you would

do well to examine what skilled science fiction convention organisers do, how they do it, and why. Complex undertakings are exciting, intricate, and often fraught with disaster. If you are going to get good at it, learn from people who know how. Remember, successful science fiction convention organisers have made profits year after year in a very challenging business environment. They have skills worth examining and attitudes worth emulating.

The biggest and best science fiction conventions typically have a few thousand attendees who pay for the opportunity to be there, to see a half dozen authors, artists, and film stars speak and interact, to see other convention enthusiasts, to talk about their favourite books and films and fan fiction, and buy things at a few hundred vendor tables in the exhibit hall. Regardless of their political perspectives or interest in abolishing slavery, science fiction convention organisers are bringing together thousands of people for a common purpose, generally operating with a few dozen or perhaps as few as one dozen volunteers, and paying only for those products and services that cannot be had without payment. The analogy to your work as a space scout to bring together a few thousand contributors, crowd source funds for your space travel projects, and get out on to the space frontier is a good one to consider.

Please keep in mind, I'm not telling you what to do. I don't expect to give you every element of your particular path to the future, nor do I have the ability to walk any part of your path for you. I don't know who is going to be a really good resource to help you in your work. I don't know how to form you into a military-style cadre, order you about, march you in circles, impose physical training regimens, ration your food, and send you into combat to be chewed up by opposing forces. Even if I knew how to do all those things, I wouldn't do them. I wouldn't even tell you where to find the most willing donors, if I knew, because: finding things out for yourself and taking your own choices where you find them is what it means to be free.

I don't want you to follow me. I don't want you to obey me. I don't want to tell you what to do. I want you to explore, go over the horizon, see what is there, tell other people as you are able, and have fun. I want you, in short, to be sovereign, free, independent, and self-reliant individuals. If you, as space scouts, are expecting to follow orders from me, or anyone: you are doing it wrong.

Be your own guide. Independent study is the rule of the day. There is no school of experts who have built viable space settlements beyond Earth where generations of families have been raised, yet. So, don't expect finding your path is going to be easy. Definitely don't expect me to know more than you do.

In contrast to those thoughts, I am available to help. I am eager to be a paid consultant on space business projects, and have skills, talents, and experiences in this area of human endeavour. I am also a volunteer to answer questions and provide guidance to any space scout who wants my views. Ask me anything. I'll do my best to answer, or tell you why it isn't any of your business.

Model Rocket Enthusiasts

Stories from G. Harry Stine

Many long years ago, I joined a group called the L5 Society. My next older brother, Tom, had joined L5 shortly after it was founded in 1975, and I joined in 1977. Their magazine, *L5 News* was a constant source of wonder, interest, and excitement for my brother and me.

The group was founded by H. Keith Henson and his wife Carolyn Henson. They had read the book *The High Frontier* by Dr. Gerard K. O'Neill, Ph.D. which covered the basics on building human settlements from asteroid and lunar materials, building solar power satellites to pay for them, and expanding human presence beyond Earth. You should certainly add Dr. O'Neill's works to your reading lists.

One of the innovative questions Dr. O'Neill asked back in 1968 of the students in one of his advanced seminars was: is the surface of a planet the best environment for the development of a technological civilisation? His students, and he, concluded that it is not. As a result, they began examining how to go about building human settlements in free space, in high Earth orbits, or in Solar orbits between the planets. They looked at what conditions are like in those places, how far things are from others, what mass drivers and other technologies might work better in moving asteroids and lunar materials than rockets, and how to pay for it all with solar power satellites beaming power to Earth.

Not all of those ideas were developed right away in the first seminar. There were additional sessions, including a rather famous Summer session in which early space settlement designs were discussed in detail. The “Stanford Torus” and the “Bernal Sphere” and other early designs were products of some of these discussions. It was the L5 Society's idea that space enthusiasts should ask the government to make these things happen. It was Dr. O'Neill's idea that the Space Studies Institute he founded should be an early shareholder in his satellite geo-positioning service that I believe was started as a company in 1973, pre-dating the Global Positioning Satellite system (GPS) by many years. In short, Dr. O'Neill did not trust government to implement his ideas.

Why the name L5? The name is from a group of stable zones in the solutions by LaGrange of the three-body problem in two dimensions. If you take a body of large mass, such as the Sun, and a body of somewhat less mass, such as Jupiter, in orbit around it, what are the stable zones for orbits that a third body of negligible mass in comparison to the other two (thus the “two dimensions” simplification – the third body is considered a point mass for purposes of calculation) would find in that system?

In the case of the Sun and Jupiter, there are bodies in Jupiter's orbit that lead it by 60 degrees and trail it by 60 degrees that are called the Trojan asteroids. These two groups of asteroids are in the L4 and L5 positions, two of the five stable Lagrange zones. Bodies in those zones tend to stay in those zones. There are, of course, three other points of gravitational stability in the system. L3 is opposite Jupiter in its orbit around the Sun, so it either leads or trails Jupiter by 180 degrees. L1 and L2 are points in Solar orbit that maintain position with Jupiter as it orbits the Sun, too. L1 is inside Jupiter's orbit, L2 is outside Jupiter's orbit, and the first three points, L1, L2, L3 form a straight line through the Sun and Jupiter. Go to Wikipedia or HyperPhysics.phy-astr.gsu.edu for illustrations, equations of force, information about Euler and LaGrange, difficulties with the general case of three-body problems.

Grasping firmly on the idea of artificial space settlements of enormous mass positioned in the L5 zone in the Earth-Moon system being used to house the crews working on enormous space-based solar energy systems beaming power to Earth and having NASA, the government, and various subsidies to

corporations build all these things seems to have been the founding nucleus of ideology for the L5 Society. Thus its name. As a teenager, I was very caught up in these ideas and thought them wizard. I later discovered that governments are worse than useless at everything, destroy lives, and attack anyone who attempts to do anything really useful, unless that person happens to have political connections.

In the Summer of 1987, I was working at Space Services Incorporated of America. My direct supervisor was an engineer, Mark Daniels, and his boss was the president of the company, Deke Slayton. To say that it was a small team is understatement. In August of that year I received a special invitation to travel from Houston to Phoenix, Arizona to attend the North America Science Fiction Convention. As I recall, I was asked to give a talk about the Percheron and Conestoga rocket flights that Space Services had conducted in 1981 and 1982, respectively. My part in the program, and I really don't recall much about it, was an excuse for Keith Henson, Aleta Jackson, Greg Barr, G. Harry Stine, and others to meet me and talk with me about their many ideas for accomplishing the human “break out into space.”

Harry is a particularly interesting fellow, now passed on, whose ideas and enthusiasm were infectious. He had been a model rocket enthusiast as a boy in the 1930s and a bigger rocket enthusiast in the 1940s. He became a technician, learned radio and radar, and was a natural-born story teller. One of the stories he told me in 1987 was about the early days of fixed radar sites, being used to track aircraft, including enemy bombers in the Battle of Britain. Harry was at some of these places, and when the radar was running he and his friends would occasionally hurl a ball of steel wool into the radar beam where it would burst into a shower of sparks. Quite dramatic.

Later, Harry was posted at Cape Canaveral Naval Air Station in Florida and at White Sands Missile Range in New Mexico. He was there during some of the very large-scale first rocket activities by the United States government. (Rockets in general go back to the invention of gunpowder, arguably around AD 1000, in China. American and British forces used war rockets during the War of 1812, and at other times, to attempt to subdue their enemies.) He worked on the V2 rocket programme during the post-war testing at White Sands, and he worked on the Thor programme, among others.

One of my favourite stories from Harry is about the cat in zero gravity. It is a fact of high performance air craft that you can put one into a parabolic trajectory that is, in fact, a kind of orbit. It is not an orbit around Earth, because its trajectory intersects the Earth at a couple of places. But it does give you about 30 seconds of weightlessness.

Some bright boy in the military got the idea of taking a cat up into a jet airplane to see how it would react to being in weightlessness. Cats, after all, have an enormously fine-tuned sense of balance, and great skill at turning around as they are falling to nearly always land on their feet. So, a camera system was mounted in the cockpit of a jet, the pilot was given a cat to hold, and told to take off, put the plane into a parabolic trajectory, go weightless, and let go of the cat.

The film was a source of endless amusement to Harry and his friends on the base. It shows a cat sitting on the stomach and chest of a pilot, who occasionally strokes its fur, and the cat is very calm. The pilot goes through his pre-flight checklist, cat is calm. Pilot goes on his taxi run to get to the runway, cat is very calm. Pilot screams down the runway, cat is a little tense but soon relaxes. Pilot goes up in the sky, cat is very calm, seems to be purring, still getting the occasional stroke from the pilot. Pilot takes the plane weightless, lets go of cat.

There is suddenly a ball of fur with arms and legs and tail sticking out, all the hairs going every which way, the cat moving at random, rotating and turning end for end along every axis, and as it moves around its expression of wide eyed and wide mouthed hysteria is seen on film. The pilot is visible in

the background, calm as can be, keeping the plane in its groove. Suddenly, the flailing cat gets one claw, just one, in the flight suit of the pilot, near his shoulder. The cat uses that one point of leverage to haul its entire mass “thunk!” into the pilot's shoulder, digs in all its claws. The pilot is now seen to be screaming. He grabs at the cat, tries to wrench it free. The cat is having none of it. Pilot and cat now engaged in a fight for control, cat terrified, pilot bleeding from multiple lacerations. Finally it occurs to the pilot to change the control settings, leave weightlessness, and begin his descent. By the time he gets back to the runway, the cat is slightly less tense, and the pilot manages to taxi back to the hangars. Watching Harry pantomime the pilot trying to get the cat off his shoulder and then his chest is a hilarious moment that still lives in my memory.

Another favourite story was the time the United States launched a missile attack on Mexico. It was shortly after the war, maybe 1947 or so, and testing in White Sands was still in the early days. At the time, it was well understood that V2 rockets were not perfect, and could blow up, or go off course. A package of explosives was added, with a radio detonator, so that the rocket could be blown up, deliberately, to prevent it from doing more damage. These explosives were given the name “range safety device” and the concept of blowing up the rocket if it was going off course given the name “range safety.”

Also, at the launch sites along the Southern edge of White Sands, block houses were added. These were, as the name implies, made of concrete blocks. Glass block windows were added. These were generally one or two blocks, maybe ten inches across, five inches high. That was the window looking toward the launch pad where the rocket would fire. Otherwise, the walls were solid concrete blocks. In other words, the viewing was terrible. Also, air conditioning was very rare, and not available in these blockhouses, which were very hot in the New Mexico desert.

White Sands is layed out as a rectangle of land, about 40 miles across and 200 miles long. Additional areas nearby can be evacuated by special arrangement, making even more area available for rocket testing. The nearest small city is Las Cruces, New Mexico, and the nearest big metropolis is the El Paso, Texas and Juarez, Mexico metro-plex. Rockets are launched on trajectories to the north, to keep them away from civilian population centres.

At the time, division of tasks had not been carefully thought out. The principal investigator, or scientist, responsible for the payload was given the task of range safety. Presumably the thinking was that he was a smart guy, and would also be fond of the telescope or radio system or other equipment on the rocket that was his payload, and could be told under what conditions to blow up the rocket. He would do so, it was thought, and only if it could not be avoided, since he really didn't want his scientific experiment to get blown up. This thinking turned out to be not so great.

In addition, there was one principal investigator who really hated the blockhouse. It was hot, it was stuffy, it was crammed with equipment and the bodies of technicians, it had a lousy view. So, he asked that the range safety detonator be rigged to a little handheld box with a long wire, so he could hold onto it and stand just outside the door of the blockhouse and look around the corner of the blockhouse directly at the rocket. Much better. After one or two successes with this approach, he asked that the wire be even longer, so he could be about twenty feet away from the blockhouse, really get a great view. His requests were thought to be reasonable, and accommodated. This thinking turned out to be not so great.

On the fateful day, Harry told me one afternoon in Phoenix, the technicians set up a V2 rocket, put this guy's payload on it, and got ready to launch. Sure enough, the science guy went outside with his long cable stretching back into the blockhouse, the little box with the button dangling from one arm.

Countdown proceeds, rocket flies up, and immediately it is clear that it is going off course. One of the guidance fins was locked, or something, and the rocket was not going off to the north on its planned trajectory. It was, in fact, heading straight up, and starting to go South from the launch pad. Now, at this point everyone in the blockhouse begins shouting “push the button, push the button.”

The science guy is standing outside and he fumbles for the box and gets it into his one hand and looks up and the rocket is directly overhead. He's thinking about a steel rain that is about to fall, and obliterate his position, and get mangled steel parts all over the blockhouse, and all through his body. He's not pushing the button. The rocket goes up further, and goes a little further South, and the guys in the blockhouse are shouting and screaming “push the button, push the button PUSH THE BUTTON!!!”

These demands are not carried out because science guy is frozen in place, and the rocket is still up above him, and he's still vividly imagining his body being mangled by falling parts and flaming propellants. The rocket heads higher, and further South, and rather more out of control, and by now the radar teams tracking it are also getting vexed, and the phone in the blockhouse rings and orders are shouted about blowing the range safety system, and more yelling takes place. The rocket heads higher, and further out of control, and finally the science guy thinks he's not going to get hit by any of the debris and is about to push the button when he hears, screamed from the blockhouse, “Don't do it! Don't push the button!”

The rocket was, at that point in its trajectory, over the city of El Paso. Lots of people were likely to get hurt. The rocket went further up, the rocket went further off course, the button was still not pushed. Finally, the rocket is clearly well South of Juarez, probably over unoccupied areas of desert, and the instruction to push the button comes, and the button is pushed. The rocket is duly blown up, and its parts come crashing down.

At this point, the base commander gets together a team to go retrieve the rocket and its payload. About a dozen trucks, with technicians, scientists, and just ordinary enlisted men, head to Mexico to go get that rocket. They get to the border, and the Federales are having none of it. Do what? Bring your military vehicles and troops and guns and what not and invade Mexico? No. Not on our watch.

Phone calls are made. A jeep is sent back to the base and more phone calls are made. Two days later, after Washington DC and Mexico City DF have worked out the political and diplomatic implications, the convoy starts up and goes through Juarez. They know the area where the rocket crashed, which is in a cemetery not far outside town. During the ride from the border, everyone is talking about what to expect. Their supposition is that everyone will have been scared away, and they thought nobody would be anywhere near this horrifying thing, this missile from America. This thinking turned out to be not so great.

Indeed, the crater where the rocket had landed was empty of all but parts of the rocket, but it was surrounded on all sides by carts, trailers, and tables, on which were displayed parts of every busted engine and broken vehicle from miles around, cut up into pieces, and being sold as souvenirs, “Parts of the rocket from America.” There was much rejoicing and a fiesta atmosphere prevailed.

The crew from the rocket base were given plenty of time to dig out the rocket parts, and generous cooperation by the locals, who really didn't want the rocket, but did enjoy the spectacle. As a result of this event, range safety was taken away from the blockhouse, put in the hands of specially designated “officers” called, rather cleverly, “range safety officers” who watched radar screens and blew up rockets with great dispatch whenever the safety rules indicated. And that's the story about the first time America launched a rocket at another country.

There's one more story I want to tell from Harry's repertoire. He told me this one a little later, while the DC-X had begun its flights, when he travelled to Houston to speak at a Houston Space Society meeting at my invitation. He also had a hankering to tour the Manned Spaceflight Centre at Johnson Space Centre, so we went and did that.

Harry was stationed at Cape Canaveral in the 1950s, and he worked on several rocket programmes there. He says that as the Thor rocket programme got further along, it became clear that they were going to be able to put a small package of maybe five pounds in Earth orbit. I believe the launch in question was to take place in September 1957. I don't remember all the details, because my auditory memory is not nearly as good as my visual memory. I do remember Harry saying that he worked on this project with Bob Truax, which is a name to conjure with in space launch circles. Certainly Truax was assigned to the Thor programme at the time.

In any event, word went forth from the technicians to the engineers. Word went forth to the science guys. Several ideas for different things one could put into orbit were bandied about. Word went forth to the mission commander, a junior officer. The junior officer went to his superior officer. Word eventually reached the base commander. And the word came back, “The Navy is putting the first satellite in orbit, fill the upper stage with sand.”

Early in October 1957, the Soviets launched Sputnik, to the consternation of the world. If Harry's story accurately reflects events as they happened, the politics of inter-service rivalry prevented the United States air force from putting the first payload in orbit. I have no way of corroborating this story, and don't much mind if it proves to be false. Certainly I expect it to be vigorously denied. It is consistent with my experiences with the military, and it certainly has the ring of truth about it.

With these stories in mind you should be aware that Harry wrote science fiction stories under the pen name Lee Correy, and science fact articles under his own name. Once upon a time I had a copy of his book *Halfway to Anywhere* bearing his autograph. The title is from a passage written by Robert Heinlein, that in terms of change in velocity, once you reach Earth orbit, you are halfway to anywhere in the Solar System. You should verify the maths involved, but I think you'll find it basically true.

Early in 1957 Harry wrote an article for *Mechanics Illustrated* about rocket safety. He then received a letter from Orville Carlisle, who had started making small model rockets as well as replaceable solid fuel engines to power them. Harry really liked this idea, and wrote the cover article for the October 1957 *Mechanics Illustrated* about Carlisle's rockets – which presumably hit the newsstands in September, shortly before the country went space-crazy from the Sputnik launch. Harry and Orville co-founded Model Missiles, Inc. They also formed the Model Missile Association, which became the National Association of Rocketry. Harry wrote the group's safety code and served as its president until the late 1960s.

As a result of Orville, Harry, and other men and women who learned about model rockets from them, my brothers and I began to fly model rockets in the late 1960s and early 1970s. I remember numerous trips to Broken Arrow park near the southern edge of town for various rocket launches. My friend Carmi Weinzweig even launched a model rocket from the sun dial in the centre of Columbia University's campus one day in early 1983.

Model rockets grew and grew. In late 1989, I was shown a scale model of a six-stage rocket capable of putting a golf ball in Earth orbit (an extremely low, unstable orbit) based entirely on model rocket solid booster engines. This vehicle did not use “A” or “B” or “D” engines, but “M” engines. The rocket was never flown, but a great deal of thinking went into it.

In writing this chapter, my purpose has been to entertain and excite your imagination. But I also want to point out that groups like the National Association of Rocketry, its predecessor the Reaction Research Society, and Friends of Amateur Rocketry, among many others, are dedicated to actually flying rockets. I believe it is people who act that make the biggest difference, and people who talk who only very rarely do. So, if I were a young space scout looking for practical help in putting myself into Earth orbit, I would go find these rocketry enthusiasts who actually build and fly rockets.

Scout Sniper

The Shooter's Culture

There are a number of sayings that shooters find valid, and a significantly larger number of sayings that shooters find annoying af for excellent reasons in each case. My purpose here is not to give you all the aphorisms you'll ever need, but to point you in some important directions.

One of the mixed bag sayings is: knowing is half the battle. It isn't, of course. Knowledge is found in libraries, in training sessions, in being shown what to do by someone who knows, in conversation. Very few battles are fought in libraries, seminar halls, and talking out loud can get you killed quite suddenly. Situational awareness is a major element in winning battles, and should be understood to be entirely distinct from general knowledge. What you bring to a battle in terms of plans, ideas, knowledge, and pre-conceived notions may have significant impact on whether you leave the battle alive, dead, victorious, or defeated. But the whole of battle is fighting.

No battle plan survives contact with the enemy. A corollary that I like is: no business plan survives contact with the market. Do either of these statements imply that we should never bother to plan? Of course not. A failure to plan is a good plan to fail. Planning matters, and more contingency plans are better, but nobody should ever confuse planning with fighting. Things change while you fight. The enemy exists, has ideas, may develop situational awareness, has assets, knows things, has their own plans. Being in a battle is like nothing you have ever done, until you've been in a battle.

When you consider whether you wish to add the skills of sniper to your skills as a scout, you are considering a dramatic upgrade. The ability to selectively target and eliminate enemies is one of the elements of fourth generational warfare that is more important than any other aspect of the fight against centralised control, command economies, and all other forms of slavery. Simply put: if you remove the people who give the orders, the people who are only there because they were compelled to be there are unlikely to put up as much of a fight.

Scout snipers have a host of skills to learn, so this upgrade is not without hardship. You will learn to be an expert marksman in all conditions. Dry heat, dust, broiling Sun, and a day without water is going to make you a very different shooter than humid air, constant wet, continual rain, and three days without being dry. Wintry cold is going to challenge you in other ways. If you are going to be a scout sniper, you should learn to be a marksman in a wide variety of conditions. Your necessary survival skill is to be able to make one shot, kill your intended target, and get out safely.

In addition to marksmanship, you are going to need to learn fieldcraft. You are going to learn how to track an enemy, how to overhear his conversations, how to find his weaknesses, how to infiltrate his position, how to exfiltrate from your position. You are going to need to learn many different forms of movement. Dragoons and snipers may ride into battle on horses, dirt bikes, personal air vehicles, or any manner of other systems, but they dismount before fighting. Dismounted, prone, belly crawling, in cover, in concealment, at night with or without night vision aid, and, as above all weather, all conditions are necessary elements of your training. If you feel a strong abhorrence to crawling through 500 yards of human sewage, you may not be mentally prepared to become a scout sniper.

Fieldcraft also includes living in the field. You may or may not be able to pack in enough rations, enough water, enough changes of dry clothing to reach your objective and escape safely. You may need to take game in the field, identify poisonous plants, including those with skin contact poisons like poison ivy to avoid, identify edible plants, and be aware of all manner of hazards from quick sand to

predators to deadly insects or snakes. Now imagine your battlefield is on Mars or the Moon, and contemplate fighting in those conditions.

A sniper has a weapon. An effective weapon is a rifle, and there are many ways in which to have an effective one. Very likely a sniper is going to be effective with a scope sighted rifle that has consistent firing characteristics – a bolt action rifle is generally more consistent than any automatic rifle. Another extremely effective sniper weapon is the rocket propelled grenade launcher.

Snipers need not act alone. A competent sniper team may be composed of a sniper and a spotter. Each would be capable of doing the other's job in the event of injury or death. Each would be equipped with a battle rifle capable of select fire, as well as other equipment – grenades, landmines, other explosives, knives, wire cutters, to name a few. A sniper team may also include additional personnel. Two rocket propelled grenade launcher operators, two spotters, one sniper might be an especially deadly squad.

You cannot know in advance how you are going to obtain your objective. You can know a great deal in advance, though, including details about terrain, details about conditions that affect your shooting such as wind speed and direction, humidity, and other factors. Knowing more, being more adept at your skills, and having the fortitude to complete your mission whatever you've decided it is, can make the difference between success and failure. Failing to kill your intended target is not the worst possible failure mode. The worst failure is probably your entire sniper team being killed, or captured and tortured slowly.

Who would you kill? Of course, everyone seems to start at such questions with a theory or a slogan. Taming unchecked aggression, say, or eliminating corrupt officials linked to murders. The question of who to kill should be: those who deeply, richly, and totally deserve to be killed.

How would you know? You can certainly find a lot of resources on the web, including Wikileaks and Open Leaks. Information about people who have been persistently connected to wars, state violence, police brutality, and other misdeeds is available. Information about how these people live and credit ratings on them are available on the web, sometimes for a small fee, from various public and commercial databases. But information is not a conviction.

You should reflect on what standard of evidence you believe is appropriate before regarding someone as fit for the death penalty, to be inflicted by you. You should reflect on whether other people should have some say in the matter, whether the accused should be able to speak in his or her defence, whether a process is to be followed. I'm not proposing that you follow a set of rules that I come up with, because I don't have such rules. I can point you at historical resources about how judicial systems have been, how they have adapted to changing conditions, who has used what systems of law, and how the death penalty has been administered over thousands of years.

Since I am, myself, against the death penalty, I don't regard it as a likely deterrent. In fact, considerable evidence suggests that state-managed death penalty is expensive, ineffective, and has no deterrent effect. The counter argument, of course, is that the death penalty completely eliminates recidivism. People who are killed never seem to commit the same crime ever again.

I am not myself a sniper. I have been in a fire fight, in Africa. I have seen a number of occasions, about a dozen going back to August 1991, when I felt it was important to draw a gun to defend myself or others. Please don't look to me for advice on who to kill, how to kill them, or why. Part of you being sovereign, independent, and self-reliant, is you coming up with your own path.

Nobody else can walk your path for you. You can get guidance from many different people. You can think about what to do, meditate, pray, ask for divine guidance. But when it is time to go out in the

world, scout locations, find a wrongdoer, and end them, you have to do that part yourself. You and your sniper team have to train, have to think, have to plan, have to practice, have to go, and have to do what you are able to do. I will not tell you what to do.

Confronting Overseers

Non-Lethal Force Measures

After completing an earlier draft of this essay two days ago, it has occurred to me to bring in one more set of useful ideas that space scouts, including sniper scouts, may wish to consider. The basis for these ideas comes from a book by Paul Rosenberg, *The Breaking Dawn* which I heartily recommend.

In it, Paul points out that killing affects both target and killer. There are valid reasons for killing in self-defence, in retaliation for violent crimes, and when a pernicious person has revealed a design to go on killing a great many persons. However, there are also valid reasons to avoid killing anyone, including the reason: it makes you feel tremendous feelings, feelings that work on your very soul.

I do not say that these feelings feel bad. In fact, many people who have never killed, and then do, have remarked upon the strangeness of actually liking the act of killing. If you find the idea horrifying, and you prefer to never kill anyone, that is certainly a good thing about you. You should not be ashamed of not wanting to deal death.

There are, of course, many situations where you cannot defend yourself without using deadly force, and whenever you use deadly force, you have to be aware that killing someone is part of that combination. I encourage you to be active in self-defence, in defending yourself, your liberty, your property, your loved ones. Therefore, I strongly encourage you to keep and bear arms, the best and most modern weapons you can afford, that serve the purpose of projecting lethal force against others. It is, at times, necessary to pick up a weapon and be the chooser of the living and of the slain.

However, there are also ways in which to completely immobilise someone else. Careful use of tranquiliser darts, for example. In his book *Snow Crash*, Neal Stephenson writes about a “loogie gun” that spits a kind of gummy material which spreads over the first surface it hits and hardens, as a composite epoxy. It is possible to lasso moving targets and quickly subdue them – if you doubt me, watch a rodeo some day. There are guns which project nets. There are bolas which are balls connected by cords – one swings the connected weights over one's head much like with a lasso, and tosses them to entangle the feet of your target.

Once again, it is important to understand: I am not telling you what to do. Nor am I placing a moral impediment in your path. I am not saying that you are unable to judge right from wrong. On the contrary, I believe you are well-adapted to doing so, or you wouldn't be reading this booklet. I am not saying that you must not, or that you must, do one thing or another. I not only refuse to place you under my command, because I do not seek any such responsibility for your conduct, I also very clearly **cannot** choose for you in any situation where I am not aware of every aspect of your situation, including how you feel from moment to moment. You have to choose what you think is the right thing to do.

Therefore, when confronting overseers, the whip hand of government, it may seem to you that the best thing to do is to simply kill them. It certainly nicely eliminates the prospect for future aggression from them, and as aggression is criminal, it cuts way back on recidivism. However, it may seem to you that the best thing to do is to recognise that they are your brothers and sisters, that they have been led astray,

and that they may redeem themselves in the future, by some means – by seeking forgiveness and by engaging in meaningful acts of contrition. The system which is enslaving your brothers and sisters is also enslaving the overseers who enforce its dictates.

Having tools and chemicals, strategies and tactics, that provide for the administration of non-lethal force may be very helpful to you. You may not need to kill, you may not want to kill, you may face much more severe consequences if you do kill, and if there were a way to avoid "kill or be killed" many who have killed would have wanted another choice.

Knock-out gas and tranquiliser darts, even simple tools like choloroform on a rag, can be effective. However, dosages matter, and if you are dealing with smaller persons, a non-lethal dose for someone massing 280 pounds may prove lethal for a person massing 90 pounds. Rather worse in many tactical situations, a gas disperses rapidly as it expands in still air, and outside air is often quite windy – so your neutralising gas may have no effect. The people you want to knock down may not even get a dose of the gas attack, and if the wind shifts, you might.

Much has been made of the "Geneva convention" and other treaties resulting from the Peace of Westphalia, restricting the use of death gas in warfare. However, its withdrawal from widespread use, and its general condemnation after the war of 1914 to 1918 certainly had a great deal to do with its limited effectiveness in use, because the wind would disperse it, or carry it back on "friendly" troops. The same tactical issues exist for non-lethal gas.

There are certainly non-lethal weapons and tactics that have not been mentioned here, and almost certainly many designs for such tools that have yet to be widely seen. You might want to invent some. Effective non-lethal tools that overwhelm and subdue targets may be very useful to you, and you also may encounter them in the hands of state actors, or, as I call them, overseers. So, thinking about non-lethal force is certainly a good idea.

How you choose to behave is up to you. What tools you use is your choice. Be bold, and be wise.

The Beginning at the End

Your Stories Go Here

My goal has not been to tell you what to do, who to be, nor how to act. My goal has been to entertain you with this parody of a field manual, with stories and tales, with facts and figures. Most of all, my goal has been to inspire you to choose for yourself.

I think it would be very exciting to see hundreds of thousands of people become space scouts. I would anticipate at least that many people on Earth are already interested, eager, and willing to explore their universe. I don't anticipate more than a few thousand of them getting into space in the next 20 years, but now is the time to expect those first few thousand.

You have read this field manual, since you are here on this last page. You don't want it to be over, and the good news it is not. You are surprised that I haven't told you a whole lot more, but that is, as I've mentioned throughout these pages, very deliberate on my part. I'm not going to hold your hand, reinforce your confidence, and talk you through every step. I cannot.

You have to learn on your own. You have to motivate yourself. You have to convince yourself of the idea “I want to go,” and then learn everything you need to go. You have a lot of learning to do, in mathematics, physics, chemistry, astronomy, astrophysics, history, ancient cultures, anthropology, world travel, scuba diving, manufacturing, design, engineering – there is no complete list of disciplines. You have to figure out how to organise people, gather resources, fund raise, build a team, put a system together, and get into space. You have to do these things if you want to be a space scout.

I cannot do that wanting for you. I cannot want it so bad for you, get the fire in your belly roiling every day, get you jonesing for the space frontier. I'm doing that for me every day. You have to do you.

Please don't come to me and ask me to lead you, order you around, command you. I'm not looking for followers, serfs, apprentices, nor slaves. I'm looking for generations of men and women to see this booklet as a guide, as a possibility, as a parody. I want you to reject this booklet and say, “I can do a better job, I know what being a space scout is like, I can write a real Space Scouts Manual.”

Most of all, I want to see future generations think of space scouts as people who were bold, innovative, independent, free thinking, and determined. Never follow:

Space Scouts Lead the Way