Is Anybody Out There? Little Green Men and the Fermi Paradox

Address to the Melbourne Unitarian Church, Sunday December 11, 2011

This is the final service of the year, and the one closest to the Christian holiday of Christmas, a story which has several supernatural miracles which nearly everyone here would find improbable, if not impossible. Many years ago, when I barely an adolescent, I had a discussion with a much older adult of a fundamentalist Christian religious persuasion. They were most distraught with a newspaper report at the time which stated that most high-school students thought that the alleged miraculous conception of Jesus, the appearance of angels and the ascension to the heavens could be explained by alien visitation. Their emotional state wasn't improved when I suggested that perhaps Elijah's chariot of fire could fit in the same category, as the second book of Kings states: "And it came to pass, as they still went on, and talked, that, behold, there appeared a chariot of fire, and horses of fire, which parted them both asunder; and Elijah went up by a whirlwind into heaven". Clearly displeased I was told by my elder not to be so ridiculous. Apparently extraterrestrial life was a ridiculous proposition compared to supernatural divine intervention.

It is not as if cosmic pluralism, the idea that there are many worlds where intelligent life exists, has not been part of human thought for thousands of years. Six hundred years before the beginning of the common era, Thales, the founder of western philosophy, rejected mythological thinking in favour of natural explanations. As part of this rather modern outlook he came to the conclusion that the universe was infinitely large, and therefore must contain infinite lifeforms. This position, supported by Democritus and Epicurus, however stood against those who argued in favour of the geocentric model of the universe, along with its inevitable suggestion that earth was somehow special and set apart the rest of the natural world, a position supported by Plato and Aristotle. This geocentric world view, where Earth was the centre of the Universe, was especially supported by the Christian churches and as a result there was not much discussion on the topic of life on other planets, although it must be said the Church never made an official statement on the matter, and there is evidence that in the 13th century the Bishop of Paris did admit to the possibility of otherworldly life.

In contrast, other religions embodied otherworldly life into their mythology. The Hindus and Buddhists, for example, each speak of multiple worlds, or Loka, although these are inhabited with beings of divergent moral persuasions. In the ancient Norse mythology there were nine homeworlds, one for each of the species that appear in the Poetic and Prose Edda. In the Islamic world "The Adventures of Bulukiya", part of the compilation that would be known as the Thousand and One Nights, includes the journeys of the protagonist across the seas, to Heaven and Hell, and travel across the stars different worlds and alien lifeforms such as talking trees. The Japanese Shinto folk tale of The Tale of the Bamboo Cutter from the 10th century has princess of the Moon people visiting Earth. The Jewish Talmud states that there are at least 18,000 other worlds, and the great medieval Jewish mystical text the Zohar claims that there seven earths, domains of intelligent creatures, separated by the firmament.

Now these are, of course, all just speculative stories which show at least some interest in the idea that we may not be the only life in the universe and least still, the only life of note. In a modern and scientific sense the invention of the telescope in the early 1600s and the development of Copernican heliocentric cosmology provided a more firm foundation for such interests. The great Italian philosopher, Giordano Bruno, argued that the universe was infinite, every star had planets, and that other worlds "have no less virtue nor a nature different to that of our earth" and, like Earth, "contain animals and inhabitants". It is unsurprising to discover that Bruno was classified as a heretic by the Inquisition for his pantheist views and burned at the stake. These are expositions of what contemporary philosophers of
A famous elaboration of these principles occurred in a meeting in 1950 at the Los Alamos National Laboratory when four nuclear physicists, Emil Konopinski, Herbert York, Enrico Fermi and Edward Teller (who would receive, in 1991, the first IgNobel Prizes for Peace in recognition of his "lifelong efforts to change the meaning of peace as we know it" due to his long advocacy of nuclear weapon development). The physicists were discussing a recent spate of supposed UFO sightings and supposed calculations and idly calculating the possibility of alien visitation when suddenly, in the midst of lunch, Fermi exclaimed "Where are they?". Since then called "The Great Silence", or the "Fermi Paradox" the problem can be simply be stated as follows; given the size and age of the universe there should be many advanced and intelligent extraterrestrial lifeforms - and yet there is no strong evidence to suggest such lifeforms.

Even our own galaxy, which is but one of more than 170 billion in the universe, there is an estimated 300 billion stars, spread across a diameter of some 100,000 light years. Our galaxy, almost as old as the universe itself at 13.6 billion years, has had more than ample opportunity to develop intelligent life other than our own. Astronomer Frank Drake, now Emeritus Professor of Astronomy and Astrophysics at the University of California, Santa Cruz, developed a simple equation to calculate the number of extraterrestrial civilisations in our galaxy; based on the number of stars formed per year, the number of stars that have planets, the number of planets that can support life, the possibility that planetary life will become intelligent life, and the possibility that such intelligent life would develop a technology that would be detectable, such as radio waves and the period of such technologies. The equation itself is sound, but many of the variables in the second-half of the equation is utterly unknown to our own current technology.

Further, there is a counter-equation is put by some astrobiologists and planetologists who claim that the conditions for life, let alone intelligent life, are the result of some very peculiar conditions (such as being in a habitable zone, a large moon, the magnetic field, plate tectonics etc) which make Earth a very special and perhaps entirely unique place in the galaxy, if not the universe - this is known as the "Rare Earth" hypothesis. As a response to this, it is suggested by other astrobiologists that all of these conditions are not necessary for life. Even in our own solar system there are several satellites of the gas giants that potentially harbour life through the presence of water, carbon and geothermal heat. Even oxygen is not necessary for life; on earth itself, small animals have been recently discovered that live without oxygen in an environment of supposedly poisonous sulphides. Early this year the Kepler Space Observatory mission released a list of over one thousand planets outside of our solar system, of which dozens were in a habitable zone. Extrapolating the data, it is estimated that there is at least five hundred million planets within a thousand light-years of Earth that fit this criteria.

These serious endeavours have been matched by amateur speculations, pseudo-science and worse. UFOs and other popular alien phenomenon have included pranks such as crop circles, the disturbing practise of cattle mutilations (with one prominent UFO researcher claims that aliens are collecting genetic material), and claims of alien abductions, implants and even claims that aliens secretly control the world. For example, a former UK Green Party spokesman and television personality, David Icke, is a major figure among contemporary conspiracy theorists; noting the very real connections between members of the international power elite, he concludes the world is actually run by shape-shifting
alien reptiles which suffer from bloodlust. Returning back to religious interpretations many members of the Church of Latter Day Saints, more commonly known as the Mormons, believe that the literal home of God is on the planet Kolob, whereas the Scientologists that much of what we would consider psychological problems are due to an alien villain named Xenu, the totalitarian ruler of Galactic Confederacy who brought billions of alien peoples to earth, stacked them inside volcanoes and killed then with hydrogen bombs.

Taking a much more optimistic interpretation, the Argentinean Marxist Juan Posadas was convinced that technologically advanced alien civilisations must, by the laws of historical materialism, must be socialist societies. Political groups influenced by Posadas were quite serious; they engaged in trade union activity, in socialist publications and operated in secret under Latin American dictatorships - eventually they became advocates for the Soviet Union and China to engage in a first strike nuclear attack against capitalist countries and indeed an extraterrestrial appeal: "We must call upon beings from other planets when they come to intervene, to collaborate with the inhabitants of the Earth to overcome misery. We must launch a call on them to use their resources to help us."

Perhaps it is not surprising that such wild thoughts come about. Over the centuries there has been a progressive decentering of the human mind and human self-importance. Our entire social world, when compared to the physical vastness of space, is a truly humbling experience, a gentle reminder not to turn social and political ideologies or even personal expressions into some sort of metaphysic. In 1990 Voyager photographed Earth from six billion kilometers, just on the edge of Pluto's orbit - Earth appeared as just a pale blue dot, about 0.12 pixels in size. Astrophysicist Carl Sagan reflected:

"Look again at that dot. That's here. That's home. That's us. On it everyone you love, everyone you know, everyone you ever heard of, every human being who ever was, lived out their lives. The aggregate of our joy and suffering, thousands of confident religions, ideologies, and economic doctrines, every hunter and forager, every hero and coward, every creator and destroyer of civilization, every king and peasant, every young couple in love, every mother and father, hopeful child, inventor and explorer, every teacher of morals, every corrupt politician, every 'superstar,' every 'supreme leader,' every saint and sinner in the history of our species lived there? on a mote of dust suspended in a sunbeam."

So where are they? Perhaps complex life in the universe is a lot rarer than what is supposed and no other technologically advanced civilisations have arisen. There is even a strong argument that claims that intelligent life is inherently self-destructive, that the development of technological power will inevitably fail to an error of moral reasoning. Perhaps intelligent life is sufficiently far apart in space and time that contact is highly unlikely, given the short period that we have searched. Perhaps broadcast radio is a technology with a relatively short use within a civilisation.

What is certain however, as one of the English translations of The Internationale spoke is that we should not expect a saviour from on high to deliver us from our earthly problems, whether that is divine or alien. But that does not mean that the search should be abandoned. Certainly, if intelligent alien life is discovered it will be a most extraordinary and wonderful experience for our species - hopefully we will be mature enough to treat them with requisite hospitality and hopefully they will be of good intent as well. Every so often, there is a glimmer of hope - just a few days ago, NASA scientists at the Kepler mission confirmed the discovery of a planet, in its star's habitable zone, with a a surface temperature of about 22 degrees Celsius (if it has an atmosphere), which will allow water to form.

In 1972 Carl Sagan quoted the attributed words of Thomas Carlyle on the possibility of life on other planets, which combined both a little bit cynicism juxtaposed with a comment on an unfortunate design flaw of the universe.

"If they be inhabited, what a scope for misery and folly; if they be not inhabited, what a waste of space."

Source URL: http://levlafayette.com/node/306