

IS THERE INTELLIGENT LIFE ON EARTH?

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A few weeks ago, I purchased Carl Sagan's 1994 book "*Pale Blue Dot: A Vision of the Human Future in Space*" for \$1 from Habitat/Restore off Crawford Street, Dunedin. I have found the book to be a fascinating read full of high-quality photographs of the planets in our solar system, stars, and galaxies all taken from outer space by a number of spacecrafts and the orbiting Hubble telescope. One chapter in the book is titled "*Is There Intelligent Life on Earth?*" This chapter describes the perspective of an alien spacecraft visiting our solar system seeking to determine whether there is life on any of the planets. A galactic ethic allows the alien spacecraft to orbit each planet, but strictly forbids a landing.

The spectrometer on board the alien spacecraft enables detection of gases in the atmosphere of each planet. By a process of analysis of the existence and proportions of each of these gases, the aliens are able to establish whether, at minimum, there is a microbial level of life on each planet. The aliens orbit the planet Earth where they detect some form of life. Magnified photographs of the surface of the planet with various filters reveal that a life form has developed sufficiently to a level of technology which has modified the surface of the planet. Closer examination reveals that the technology of the organism is also in the process of changing the planet's climate which threatens all life forms on the planet. The aliens ponder whether this dominant organism has noticed what is happening. Is this organism oblivious as to its own and fellow organisms' fate? Is it unable to cooperate and work together on behalf of the environment that sustains all organisms on the planet? Before flying to the next planet, the aliens are in doubt as to whether there is intelligent life on Earth.

The alien's spacecraft above used the same spectrometer technology that was on board the *Galileo*, the 1990 NASA spacecraft designed to explore the giant planet Jupiter, its moons, and rings. To get to Jupiter, the *Galileo* had to fly close by Venus and then twice around Earth in order to accelerate fast enough to escape the gravities of these planets and fly towards Jupiter. The *Galileo* passed within 960 kilometres above the surface of Earth. Spectrometer analysis and photographs of our planet Earth by orbiting spacecraft and the space station since 1990 have documented further decline as observed in 1990 – loss of top soil to the oceans, loss of vegetation, loss of ice on the mountains and around the Arctic and Antarctic circles, rising CO₂ levels accompanied by a rising average global temperature, and increasing desertification. Some 30 years after the *Galileo* left Earth, we should be asking the same question as the above Aliens in Carl Sagan's story. Does humankind have sufficient and necessary intelligence to continue survival on our planet Earth?

The insect world such as bees and ants evolved into super organisms which cooperate to ensure their continued survival. Humankind initially evolved as tribes restricted in numbers to fewer than 150 people in each tribe. Each member of the tribe knew every other member in the tribe and also had an intimate knowledge of their immediate surroundings and the role that each flora and fauna played in that ecosystem. Billions of people on Earth now also form a super organism which is reliant on global supply chains of goods and services and global chains of information for its survival.

Humankind survived for many thousands of years as tribes until the start of the agricultural revolution some 10,000 years ago. The surplus that agriculture enables led to the rise of cities, increases in population densities, and eventually to a sharp increase in the exponential growth in populations when the discovery and use of fossil fuels and innovations in technology enabled major increases in the level of surpluses. Greater surpluses have also led to greater conflict as to who should benefit from that surplus.

Although our technology has evolved immensely since the use of fire and stone tools, especially over the last century, at the biological level humankind has not evolved and adapted sufficiently to cooperate without conflict with groups in numbers far greater than the tribal level of about 150 people. The problems we are currently facing and having to deal with are social and political. We have the technology and currently sufficient energy in the form of fossil fuels to resolve our problem of climate change by transitioning from fossil fuels to renewable energy. Unlike other organisms on Earth, we also have the mental capacity and means to restrict the size of our human population. We are not bound by the edict of instinct to procreate ourselves out of existence by overshooting the carrying capacity of our global ecosystem.

The longer we delay in transitioning from fossil fuels to renewable energy, the more difficult it will become due to the inevitable peaking in the rate of production of all forms of fossil fuels and also the peaking of the mining of minerals necessary for investment in infrastructure required to generate renewable energy. Our current COVID-19 pandemic is exacerbated by our current high population densities in cities and our current dependence on globalised supply chains. Do we have sufficient intelligence to look beyond our current immediate focus on responding to what could transpire to be but one of a series of ongoing pandemics? Our problem of climate change is not going to go away in the meantime and will become more dire unless we act now to transition from fossil fuels to renewable energy.

Humankind should have used fossil fuels to transition to renewable energy when only 10% of our endowment of reserves had been consumed, but humankind ignored Limits to Growth warnings almost 50 years ago about the possibility of our current predicament. The need to transition from fossil fuels to renewable energy now involves massive investment in new infrastructure which, in turn, involves the burning of additional fossil fuels (renewables cannot bootstrap itself without the use of fossil fuels) at the very same time that we need to reduce greenhouse gas emissions while the rate of supply of conventional oil is peaking and the Energy Returned on Energy Invested (EROI) of fossil fuels are declining. We now have what is called a wicked problem. According to Wikipedia:

"In planning and policy, a wicked problem is a problem that is difficult or impossible to solve because of incomplete, contradictory, and changing requirements that are often difficult to recognize. It refers to an idea or problem that cannot be fixed, where there is no single solution to the problem; and "wicked" denotes resistance to resolution, rather than evil. Another definition is "a problem whose social complexity means that it has no determinable stopping point". Moreover, because of complex interdependencies, the effort to solve one aspect of a wicked problem may reveal or create other problems."

There is no easy, simple, and single solution to our predicament. There are, however, simple causes of climate change and parallel ecological problems that we currently face. Climate change is but one of many symptoms caused by over-population of humankind and excessive consumption of resources provided by nature. What further complicates the choice of pathways we should now adopt during a transition from fossil fuels to renewable energy is the uncertainty as to what level of technology human settlements will be able to utilise in 50 years' time. There are strong indications that renewable energy will be unable to provide the same scale of energy per capita that we currently enjoy and that the average EROI utilised by humans will be much less. In other words, future generations will have fewer energy slaves to work for them and their life styles will be much simpler. Their quality of life, however, will not necessarily be lower than what we currently enjoy.

Action depends on Motivation which depends on Belief. Without Belief, there is no Action. Belief, in turn, depends on many factors including Understanding. Full understanding is unnecessary. We are all reliant on information from many different sources. Confidence in the sources of information is necessary before accepting and taking on board partial understanding. We are all involved in an engagement of competing stories or narratives. One dominant narrative is that continued economic growth can and should continue. Green growth has recently been proposed as a solution to climate change. This narrative claims that all we need to do is to transition from fossil fuels to renewable energy and business-as-usual can then continue. But it is logical that any form of economic growth cannot continue forever on a finite planet. All economic activity requires the use of energy and materials, both of which are limited in terms of the rate of production and extraction. Sustainable economic growth on a finite planet is a physical impossibility and the term is an oxymoron. Surely even the most die-hard proponents of economic growth would agree to that logic of impossibility. However, many proponents of continued economic growth are reluctant to consider when economic growth should cease. That time is now.

Successful mitigation of climate change depends on first acknowledging and accepting that growth in population and material consumption need to be curbed and then reduced. If a person has dislocated his shoulder, then treating the symptom of pain with pain killers will not alone cure the patient. The cause and source of the pain needs to be fully addressed in order to cure the patient. Greta Thunberg tells us that she doesn't believe in the "win-win" of green growth. She tells us that real change is costly, real change requires giving things up, the loss of power and privilege, new systems, new ways of life. The child is calling out "The emperor of economic growth has no clothes". We have yet to hear the onlooking crowd also calling out "The emperor of economic growth has no clothes." In the meantime, continued economic growth can but only exacerbate the impact of climate change.

Greta Thunberg says that with her Asperger's syndrome, she sees the issue of climate change as being black and white. We don't need to have Asperger's syndrome to realise that the issue of climate change is black and white. We simply need to curb and reduce our burning of fossil fuels. Greta says she wouldn't give a pep talk about hope. If this approach had worked in the past, then greenhouse gas emissions would have gone down by now. Greta says if we are to have hope, then we must act now! The time for mere talk is over. Once we have action, then hope is everywhere.

The rich countries have a per capita rate of burning fossil fuels that far exceeds that of poor countries to the extent that even though the populations of the rich countries are much smaller than that of the poor countries, the rich countries account for the greater proportion of global burning of fossil fuels. The first step to reducing greenhouse gas emissions is for especially the rich countries to immediately reduce their per capita growth in emissions otherwise greenhouse gas emissions will continue to increase while the global population continues to grow. The current global birth rate is greater than the replacement rate and will not decline to a Zero Population Growth (ZPG) rate overnight. Even if it did, then global population would continue to grow due to population momentum. Global per capita burning of fossil fuels needs to decrease at the same rate as any increase in global population in order for the global rate of burning of fossil fuels to just remain static. Further reductions in the per capita rate of burning fossil fuels are necessary in order to mitigate the impact of climate change.

The most effective way to reduce greenhouse gas emissions is to adopt the same individual rationing approach used during the emergency period of World War II. Price signals alone of the market place have failed to protect ourselves against our current predicament. Carbon rationing as opposed to carbon taxes are also more just because higher prices of carbon have a greater impact on those on lower incomes while those on higher incomes are more able to continue high levels of consumption.

A question arises. What impedes and delays reductions in the rate of burning fossil fuels? I claim that it is the expectations of and desires for continued economic growth combined with self-interest to protect income and wealth made possible by economic growth and economic rent which has so far resisted necessary and immediate action. The expectation and desire for continued economic growth needs to be confronted and overcome to have any chance of successfully mitigating the impact of climate change. A deliberate government sponsored programme is needed to educate the business sector and the general public that expectations of continued economic growth followed by action based on that misguided belief will slow down and jeopardise declines in greenhouse gas emissions. Government, heads of government departments, and business leaders need to have the courage to spread the message that climate change is a symptom and that the root causes of climate change need to be fully addressed head on. Expectations that green growth is possible needs to be exposed as the subterfuge that it is.

For those who wish to explore issues of sustainability in more detail, please visit my website www.insearchofsteadystate.org and use the convenient search engine to hunt down resources and information.