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# Energy and the Rocket Society: At the Apogee

Don Chisholm

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On our nation's birthday we behold the dazzle of fireworks with skyrockets.

The short active life of a skyrocket begins when someone ignites the wick.

In seconds the mini rocket seems to escape the bonds of gravity as it accelerates upward, making a spectacular display of colourful energy bursts; and then, as its energy source begins to deplete, gravity regains the upper hand and the remnant casing decelerates to its apogee. With the cardboard casing still smouldering, gravity takes care of the return trip to mother Earth, whence the rocket ride began. A little bit of energy has been spent, and we all smile. Humans enjoy the effects of an energy blast.

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in the sun and went through a series of transformations here on Earth. The skyrocket fuel began with a photosynthesis process converting the sun's radiant energy to a leafy plant.

The plant was eaten by an animal. A component of animal fat is glyceride which can be distilled to nitroglycerine which is further processed and blended with other components to make fast energy release agents like dynamite, gunpowder or skyrocket propellant. After the skyrocket's energy release, some of the carbon from the original leafy plant will remain in the atmosphere as carbon-dioxide, where it may linger, or be used again by other plants.

Fossil fuels such as oil, gas or coal are the primary energy source for industrial society. They too originated in the big atomic reactor in the sky, our sun. The photosynthesis process is a key component of the

The skyrocket's energy, like all energy used by humans (except locally generated atomic), originated

Gaian interactive system in which the sun's radiant energy is eventually converted and re-converted into virtually all forms of earthly life, including humans.

Much of the carbon/energy generated by millions of centuries of plant life cycles were safely stored, layer on layer – fossilised.

With the discovery of fire, humans began to release energy from biological material. Since the wood or leaves were just there, with no human effort, it would seem that humans got something for nothing. It was part of the commons, available to all, as long as it was there. We humans have a tendency to enjoy getting something for nothing, or to want something or someone to do work for us. Over the millennia, with our reasoning mind, we humans learned to get work done for us by taking energy found in nature's sun-activated flow of water or wind – we have domesticated animals to utilise the energy these grass burners can produce. When these energy sources did not satisfy our needs, a combination of society's evolved culture of the day plus our human nature would enable us to justify the enslavement of our fellow humans, usually of another colour, race, religion or region. The energy needs of agricultural and industrial growth had to be met at any cost – a fundamental ethic of civilised society had been established.

In order for a society to justify the enslavement of fellow humans we might refer to the enslaved as, 'sub-human', or something like that. We humans have a lot of mental tricks that we play on ourselves to bring comfort for the moment. All members of the enslaving society would agree, 'we are superior to them' and righteousness would prevail while the slaves toiled.

Today, psychologists call this phenomenon, 'group-think', which still shapes societal behaviour and attitudes. Another example of a generally accepted erroneous belief is that, up until about 1500, it was generally accepted that the Earth was flat. It took agonising centuries to correct the prevailing myth.

Fortunately, it just did not matter to anyone's daily endeavour whether Earth was round or flat. No doubt, today's society harbours accepted myths which are just as incorrect.

In 1500 the global human population was about 200 million. Up until that time the population had grown slowly, mostly by territorial expansion. Each populated area soon reached its human carrying

capacity because, like all of nature's creatures, we soon procreated up to the number that could be supported by the local environment. When a species has reached carrying capacity, the number of offspring who die before reaching maturity equals those that live to procreate – this is nature's happy balance. Our human activity was then in a renewing balance with the rest of the web of Earthly life, which, as a system, is sometimes referred to as Gaia. We note here that in today's modern societies, the prevailing paradigm holds that humans should be exempt from nature's normal limiting process; we have declared that humans should have "rights". If there is a Mother Nature, she probably doesn't know or care about these egoistic rights.

A few centuries ago – a brief moment in evolutionary time – humans discovered fossil fuels and our societal skyrocket ride began. The ingenious human mind discovered thousands of ways to have carbonised energy do work for us. Our new energy slave was used to melt ore to provide the metal to make bigger and better tools to find and process more and more of nature's resources. We learned to build cars, clothes dryers and a furnace for our homes. An additional bonus was the discovery that from fossil fuel we can make fertiliser that makes soil produce far beyond its normal yield, courtesy of the rich chemical energy form centuries past. Besides fertiliser, we chemically alter and blend our slave to make thousands of new chemicals which might clean our kitchen counter or defoliate a jungle.

Along with industrial growth and technological knowledge increase, the world of medicine changed and wonder drugs and medicines and medical techniques improved. The result of all of these new-found human benefits increased both human physical size and life expectancy – and population grows. A yardstick of societal well-being is the measure our industrial/economic expansion which is in effect, the measurement of increased usage of our energy slave. Every aspect of our personal well being has become as dependent on a continuous flow of energy as the dazzling skyrockets of festive events. In 1949, an ad for Esso in *The New Yorker* said: **THE MORE ENERGY YOU USE, THE BETTER YOU LIVE.** And those of us living in industrialised societies live very well off the commons – so well in fact that our society has invented private ownership of the commons so that it can be sold by individuals or corporations, a concept unknown to sustainable aboriginal societies. Globalised industry and trade now gives us access to the commons all over the world! What a ride it has been.

The body of a hard working human utilises about 100 watts of energy (endosomatic or metabolic energy). On a per capita basis, the external energy use of each U.S. or Canadian citizen is equivalent to having 100 human slaves working for each of us 24 hours a day. At this usage rate, the expected lifetime energy demands of 126 new-born citizens is the energy equivalent (exosomatic energy) of an Exxon Valdes load of oil. Little wonder so many supertankers ply the sea! Although energy use per capita is quite disproportionate throughout the world, fossil energy use and its side effects have been instrumental in enabling the human population level to reach almost 6 billion. And our societal skyrocket accelerates ever upward.

But how reliable is this energy slave that has enabled human population to grow from 200 million to 5,700 million? Are we spending capital or renewing interest? Before analysing our global fuel supply, we need to give a little more consideration to our human nature. Our evolved culture places a great deal of importance on teaching children about the three 'R's', but we make little or no effort to teach ourselves or our children about why we behave the way we do. Besides 'group think', mentioned above, there is a variety of other overlapping interlinking quirks of human nature that it would serve us well to become aware of. For example, we have what psychologists call, 'a compartmentalised mind'. This enables us to believe in two or more sets of conflicting information, and our action (or inaction) may be controlled by either of these data sets, at different times depending on how we feel.

Sometimes our logic indicates that one thing is valid; but if we don't like what we see, we can believe in what we wish were true, especially if someone else appears to believe it too. To varying degrees we are all affected by inhibitions or compulsions that may take the form of neurotic or addictive behaviour in extreme cases. And, especially as we grow older, we become virtually addicted to the rituals of our culture and of our personal patterns of behaviour. It

may take a significant emotional event to bring us to the point of change.

Herman Daly, economist and co-author of *For the Common Good*, chief economist for the environmental division of the World Bank, coined the expression, 'wild data'. 'Wild data' occurs when the best of scientific or economic analyses indicate that the pending result of occurring events will be like nothing we have ever seen before. If we don't like what we see, we may not be able to accept those data. These 'wild data' may be ignored even though we know they must be true. And we fail to take appropriate action in response to the unpleasant or unfamiliar reality. The effects of this human behaviour are exacerbated by another well-known human foible called 'interdisciplinarity'. That means that the perceived importance of data is diminished when it is about a subject which the reader, or listener, is not too familiar. That can be a problem when someone in another discipline points out a warning which may be

life-threatening; for example, in 1980 Sir Samuel Curran, an expert on global energy resources, wrote a book called *Energy and Human Needs*. His concluding statement was: "Depletion of fossil fuel resources presents the most serious challenge of this technological age. The right answer must be found, or extremely grave problems affecting world peace and stability will engulf us all at the turn of the century." Although

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*Sir Samuel Curran. (1980)*

there may be a press release carried in big city newspapers, when specialists like Curran, and others like him, make such statements, people outside of the energy field have no substantial comprehension of the human/energy relationship, and so economists and our elected politicians, who attempt to shape our future, simply ignore the warnings. And the world of politics proceeds, encouraging economic and industrial growth as if energy resource specialists like Curran didn't exist.

A stark example of compartmentalised mind and group think can be viewed in the book, *Our Common Future*, published in 1987 by the United Nations. The book is a report on the Brundtland Commission's analysis of what seems to be wrong with our world. This commission of the UN held meetings with specialists and NGOs all over the world. It was from this report that the

famous/infamous oxymoron, “Sustainable Development”, was first coined. The book accurately reported accelerating declines in many of Earth’s life sustaining resources – apparently heading toward virtual depletion at some future point, with time being measured in decades. The chapter on energy is particularly chilling; the reported statistics are in line with other archival data: About 80% of our energy comes from burning Gaian reserves of fossil fuel,(oil, gas, coal) while about 5% is of a renewable nature (hydro, wind, geothermal, etc.). The balance comes from atomic sources. Oil extraction and processing is forecast to be non viable within the second decade of the upcoming century (gas & coal could last longer). This fact alone appears to be a societal show stopper. It was handled in *Our Common Future* in the following statement at the end of the energy chapter: “The period ahead must be regarded as transitional from an era in which energy has been used in an unsustainable manner. An acceptable pathway to a safe and sustainable energy future has not yet been found. We do not believe that these dilemmas have yet been addressed by the international community with a sufficient sense of urgency and in a global perspective.” The problem has never been addressed. The reality didn’t go away – it just went out of mind while the Brundtland Commission created a more desirable alternative to reality – sustainable development. These wise politicians knew what they were doing, because this concept has been embraced by many governments as a pillar of their green (environmental) agenda, even though few people agree on its definition. Governments provide funding to teach children about sustainable development in school while shielding them from the foibles of human nature. It appears that the UN commission has set the stage for our children to remain ignorant of facts that indicate that our societal rocket ride will have passed its apogee before they have passed middle age.

The side effects of the fossil fuel burn and the growth in human activity have been devastating for the planetary balanced web of life, Gaia. Many once-stable Gaian components are now in the process of rapid change. Some of these are:

- Declining top soil levels,
- Increasing atmospheric CO<sub>2</sub> & global temperature,

- Decreasing potable water,
- Decreasing forest coverage,
- Erratic ozone layer,
- Loss of biodiversity,

and the list goes on.

When global thinkers summarise the above effects, sometimes labelled as ecological decline, they too get the public’s attention for only a fleeting moment – the problem is too large to be dealt with within our existing social paradigm. Our libraries have dozens of examples of books and statements by brilliant researchers and specialists. There are alarming warnings by such names as David Suzuki, Carl Sagan, O.W. Wilson, Al. Gore, Farley Mowat, Paul Ehrlick, Homer Dixon or Sir Crispin Tickell. The following paragraph is typical. It was spoken recently by Reverend Thomas Berry, religious researcher, thinker, author and co-author of several books: “This is a vast biological catastrophe that we’re into. We are terminating 65 million years of the biosystems of the planet. Nothing like this has a parallel in human history. The collapse of the Roman Empire is trivial compared to this, or the change from the pre-biblical world to the biblical world. There isn’t anything we have experienced so far that gives us any idea of how to deal with it.” (re-quote from NOW, Aug 10, 1995 by Alice Kline). Carrying capacity is defined in the Oxford dictionary as: “The population (as in deer) that an area will support without undergoing degradation”. There has been plenty of speculation about carrying capacity. Some economists predict continued long term expansion. Many such claims are based on history of growth which, indeed, has been impressive. Some religious authorities claim 10 to 14 billion should be possible. The basis for such claims is unclear.

Carrying capacity, is fundamental data for the design and maintenance of any vehicle but strangely, scientific based studies of spaceship Earth’s human carrying capacity have been few. At a conference of specialists in England in 1994, conclusions indicate Earth’s carrying capacity to be less than 2 Billion. A 1994 comprehensive study by researchers at Cornell University and Instituto Nazionale della Nutrizione of Rome, was presented to the American Association for the Advancement of Science in May 95. They also concluded the maximum human carrying capacity of Earth is about 2 Billion, and that for global citizens to live in relative comfort, 1 billion should be about right. Even at these levels, the study concluded that at least 10% of the U.S. land mass would be devoted to gathering the sunshine with a variety of energy conversion systems to sustain its recommended 200

million population (U.S. population presently is now about 275 million).

About 5% of global energy use comes from renewable sources. Most of this is hydro-electric which includes projects like Hoover Dam, Niagara Falls, the Aswan High Dam, the James Bay energy project, and other mega-dam projects, many of which drastically alter the local environment. About 1% comes from wind, photovoltaic, geothermal and others. With extreme effort we might be able to double or even triple renewable energy flow. Technological data indicates that atomic energy is unlikely to become the dream energy supply it was hoped to be 40 years ago; to seriously speculate otherwise is to bet your children's future on a desirable alternative to reality. Such delusive hope can be deadly in the long term when it fails to materialise. In the following simple analysis carrying capacity is determined by a pragmatic speculation based only on what seems to be reasonable estimates of attainable renewable energy and acknowledging that a functioning economic/industrial system is an essential ingredient of a sustainable future society: Presume we could triple the renewable energy flow; presume we could maintain/sustain an industrial society if we were to reduce the energy use per capita of each Canadian or U.S. citizens by two-thirds and applied that usage globally.

Based on energy usage data in national energy archives, calculations indicate global carrying capacity to be about 500 million. Skyrockets have no renewable energy, so everyone knows the carcass will crash to Earth when the stored sunshine has been spent. For the past 200 years our societal rocket ride has been fuelled primarily with non renewable fossil energy. Visions of continued growth beyond the next few decades are fuelled with false hope. Technology has brought us many wondrous things but it has failed to bring a clean and endless supply of energy. We approach the apogee.

While there are many things global society cannot do, there are many things we could do if only we

could recognise the limits to our options; to identify the difference between realistic hope and the impossible; to believe and react to the wisdom of the doctors of Gaia – the biologists, the energy analysts, the ecologists – but mostly, the psychologists to help us understand why we have initiated and maintain a collision course with human extinction. After the apogee there will be a dramatic decline in human activity. Humans could simply react to, and be subject to, the harsh hand of mother nature's balancing process. Or we could voluntarily reduce our numbers, reduce our activity, design and industrial, technological, loving leisure society that could live within our renewable energy gathering capabilities.

We now have tremendous communication capabilities. Intelligent humans can limit procreation. We have accumulated a tremendous store of knowledge about our home, the Gaian interacting sun energised system. We also know that significant change can happen rapidly. In 1980 the USSR was a formidable world power. In 1985 it had disappeared.

We could convert our 200-year skyrocket ride anomaly into sustainable flight. We could leave our children a liveable sustainable home. Tell your family. Tell your neighbours, your friends and your politicians, local and federal. We have an unusual job to do. We have to modify the way we govern ourselves, the way we think of ourselves – our world view needs to be transformed in order to survive. While it took centuries to establish that the world was round, not flat, our conscious evolution must/can occur in just a few years. An organisation called the Gaia Preservation Coalition (Canadian Federal non-profit) consists of people who believe that we could change our way of thinking, and that we could change our world view and begin the appropriate changes to our governance. The people of one enlightened sovereign state could become a showcase example of a sustainable society. And their personal life styles would improve.

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