

Overshoot, Narcissus, and the Sirens' Song

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Retrospective Preface

This paper is part of a trilogy that represents the evolution of thinking about population among members of the Population Institute of Canada. The prime focus of the three papers is to encourage the development of sound public policies relating to population, and to shine the light of reason on many existing policies that seem to be rooted in superstition and instinct, while denying the serious environmental consequences of existing population trends.

The first of the trilogy, *Why Canada Needs a Population Policy*, was written in 2001 and sets out the reasons for change. The second paper, *A Strategy for a National and International Population Policy for Canada (2005)*, expands upon the ideas in the first paper and presents them as a series of recommendations to the Government of Canada.

The third paper, *Overshoot, Narcissus and the Sirens' Song*, outlines the dire situation of overshoot whereby humans are drawing down more resources than the Earth can supply sustainably, considers some behavioural and psychological reasons that we humans have failed to come to terms with the consequences of our excesses, and sets out some steps to mitigate the current steep trajectory of environmental decline. This paper was widely circulated on the Internet. The part that received the most positive reaction is the section titled, *How Did We Get Into this Mess*, starting at page 4.

Tony Cassils
August, 2009.

Introduction

We humans are being lured into a state of overshoot by our own unconscious desires. Our high intelligence, sensitivity, and acute consciousness of our mortality evoke an inherent narcissism which manifests itself as the desire for limitless self-extension, for recognition of what might be called our cosmic significance. This impels us to become heroes to our selves and our species by taking action in the world often to the detriment of other life forms. Our senses bring in so much information we are in constant danger of being overwhelmed and have to engage in active repression of many of the thoughts that terrify us (such as the prospect of overshoot and die-off) in order to maintain our equilibrium and to function well. We face many temptations that have the potential to undermine us. The most pernicious of them speak to human narcissism and call to us with the sweetness of the mythological sirens that enticed sailors to their destruction by their seductive singing. The sirens of today comprise proponents of economic growth and contemporary advertisers armed with the insights of cognitive psychology and linguistics. They draw humanity into the trap of overshoot as we heap material offerings on the altar of fragile self-esteem. On his voyage home from Troy, Ulysses warned his crew to plug their ears with wax to block the sirens' call and lashed himself to the mast so he could not throw himself into the sea when he heard their song. As the leader, he had to confront the threat, to experience its attraction, and resist its call. All humanity will have to do no less if we are to survive overshoot.

Overshoot ranks as one of the major threats to the future of the living Earth and of human civilization. For humans the danger is magnified by the misperception that much of our journey into overshoot is "progress."

This paper will examine the following aspects of overshoot: What is it? Is humanity in a state of overshoot on Earth? How did we get into this mess? Are humans able to extricate themselves from overshoot? What can we do to mitigate its effects?

What is Overshoot?

William Catton Jr. explained the condition of overshoot in his brilliant book, *Overshoot: The Ecological Basis of Revolutionary Change*.¹ Catton defines overshoot as follows: "(verb) to increase in numbers so much that the habitat's carrying capacity is exceeded by the ecological load, which must in time decrease accordingly; (noun.) the condition of having exceeded for the time being the permanent carrying capacity of the habitat."²

In the past 10,000 years the human population has increased from 5-10 million to about 6.5 billion in 2005. At first, this growth was sustained by displacing other species from land areas, but in the past two hundred years, humanity has expanded enormously based on a much more precarious practice of rapidly drawing down finite natural resources,

many of which are becoming scarce. The transition from living sustainably on the Earth to drawdown can happen seamlessly. Overshoot can even generate a surge of wealth, for example, as occurred with the discovery of oil in many parts of the world, and the resultant prosperity in the short-term reinforces the belief that this is the proper way to proceed over the longer-term. This is the illusion that currently bewitches the mass of humanity with the dream of easy money. Paved with such deception, this road leads inevitably to collapse and die-off.

Is Humanity in a State of Overshoot on Earth?

Evidence suggests that humanity is now in a state of overshoot, and this situation is rapidly worsening with the exponential growth of human numbers, demands, and the power of human technologies. In the perspective of Catton, the industrial revolution is the prelude to collapse. Wielding powerful tools, *homo sapiens* has become *homo colossus* while remaining predominantly indifferent to the environmental consequences of collective human actions. It is a tragedy with humanity playing the role of tragic hero, conscious but perhaps not conscious enough to prevent a catastrophic ending.

In 1972, The Club of Rome brought the potential for overshoot to global attention very effectively at a time when preventive steps might have avoided it. The book, *Limits to Growth*, warned of the shortages of key natural resources that were likely to occur in the twenty-first century given the projection of trends then in place. *Beyond the Limits*, published in 1992, emphasized that humans had already overshoot the limits of the support capacity of the Earth. In *Limits to Growth: The 30-Year Update*³, published in 2004, the authors noted that human demands exceed the long-term productivity of the living Earth by about twenty percent.

These concerns are shared by The Union of Concerned Scientists, who, in November, 1992, delivered the *World Scientists' Warning to Humanity*, in which 1,700 of the world's leading scientists, including the majority of Nobel laureates in the sciences, warned:

“Human beings and the natural world are on a collision course. Human activities inflict harsh and often irreversible damage on the environment and on critical resources. If not checked, many of our current practices put at serious risk the future that we wish for human society and the plant and animal kingdoms, and may so alter the living world that it will be unable to sustain life in the manner that we know. Fundamental changes are urgent if we are to avoid the collision our present course will bring about.

In March 20, 2006, with the release of its report, *Global Biodiversity Outlook 2*, the UN Environment Programme delivered a similar message. The Report warns that humans have provoked the worst spate of extinctions since the dinosaurs were wiped out sixty-five million years ago. It emphasizes that we humans are currently responsible for the sixth major extinction event in the history of Earth. A rising human population of six and a half billion is destroying the environment for thousands of other species with the global

demand for biological resources now exceeding the planet's capacity to renew them by twenty percent. The reference here is to biological resources but just as serious for the human future is the rapid drawdown of non-renewable resources such as fossil fuels and base metals.

The following facts support the position that we are, in fact, in overshoot:

- World fish stocks are down by an astonishing ninety percent since the dawn of modern industrialized fishing about 1950. Some desperate fishers have taken to bombing coral reefs, turning them into underwater deserts.
- A third of all amphibians, over a fifth of mammals, and a quarter of coniferous trees, are threatened with extinction.
- Human activity has caused between fifty and a thousand times more extinctions in the last one hundred years than would have happened due to natural processes.
- Sixty percent of the services provided by the world's ecosystems that support human well-being are either degraded or heading that way.
- The fastest deterioration of ecosystems is occurring in developing countries where population is growing the fastest.
- Forty percent of agricultural land has been degraded during the past century.
- The UN World Water Development Report (2003) projects that, at worst, as many as seven billion people in sixty countries could face water scarcity by 2050. Even under the most favourable projection for water, an estimated two billion people in sixty countries will live water-scarce lives by 2050. Meanwhile, humans are drawing down underground aquifers and polluting fresh and marine waters at an accelerating rate.
- There is increasing agreement that peak oil, the point at which the global production of petroleum will begin to decline, has already occurred or is near.
- Inexpensive oil is the foundation of modern industrial civilization and declining supplies will have a devastating effect on most aspects of human life:
 - Ninety percent of transportation is fuelled by oil.
 - Oil is essential for construction, consumer products, heating, manufacturing, and electronics.
 - It is critical for all aspects of modern agriculture: fertilizers, farm machinery, pesticides, refrigeration, and transportation. It has been estimated that our food in Canada travels an average of 2080 kilometres from farm to plate.
- It is very likely that peak oil marks the end of the growth phase of global industrial society. This a natural part of the cycle of any dynamic system. The initial growth phase is followed by decline when the higher grade resources become depleted.

The following comment taken from the Millennium Ecosystem Study sums up current conditions:

“The changes made to ecosystems have contributed to substantial gains in human well-being and economic development, but these gains have been achieved at growing costs. These costs include the degradation of many ecosystem services,

increased risk of abrupt changes, and increased poverty for some groups of people. These problems, unless addressed, will substantially reduce the benefits that future generations get from ecosystems.”

Our collective response to these warnings has been to press on the accelerator instead of the brakes. With globalization in full swing, resource hungry corporations, hyperactive consumers and restless migrants threaten to pick the planet clean. However, the convergence of a growing list of serious problems reminds humanity of the risk of overshoot. The risks are so overwhelming one is left in astonishment that humanity has not responded with a profound shift towards sustainability in our relationship with the rest of life.

Evidence suggests that we humans are well into overshoot and that our population and civilization may be much closer to collapse than we care to admit.

How Did We Get Into this Mess?

The probability that human civilization has ventured deep into overshoot and is not far from collapse is troubling enough, but what is even more disturbing is what it says about human intelligence, foresight, and discipline. If we are to mitigate the consequences of the horrendous situation in which we find ourselves, it is imperative that we humans acquire much keener insight into the true nature of human behaviour, and, in turn, develop behavioural patterns and appropriate institutions that reinforce behaviours that will allow us to live safely within the long-term carrying capacity of the Earth.

The Human Brain

The explosive growth of human population is at the core of overshoot. If we take a historical perspective of the issue of overpopulation, it becomes evident that humanity has responded in ways that might aptly be described as bi-polar. These often-conflicting responses are wired into our brains. While brains keep organisms alert to dangers and opportunities, they also serve as a buffer against environmental variation. Our intelligence warns the human species about external threats that may require wrenching change. But our brain is also conditioned to resist it.

The development of the brain to a level of complexity we enjoy depended on the establishment of the human family as a social and a reproductive unit. While, as individuals, we may be keen observers, we are also social animals. And the tendency of human societies is to press for the expansion of human numbers and consumption and to resist changes that are perceived as unpleasant in the short-term.

In the past two centuries, this tension between these two different functions of the human brain has given rise to two perspectives that I will identify as the *scientific observers* and the *social reformers*. These perspectives are juxtaposed throughout the history of the debate on population growth and overshoot.

The term *scientific observer* includes all those who are aware of humanity in relationship and interdependence with everything else, and who act as sentinels, as observers in the crow's-nest for signs of danger and opportunity coming from outside the human family. The term embraces sensitive observers throughout the ages but the words, *scientific observer*, are used since, in recent years, scientists have become the most specialized observers of the relationship between humanity and the rest of life. One could also say that *scientific observers* tend to be more ecocentric while *social reformers* lean towards the anthropocentric and deal with issues internal to the human species with a focus on equity and justice.

In the late 1700s, some *scientific observers* began to identify signs of global limits to human expansion and foresaw a harsh future for many people, especially the poor. The debate about population started in earnest when Thomas Malthus published his "Essay on Population" in 1798. At the time, England was in the midst of rapid population growth and there were many poor. Malthus stated that in nature, plants and animals produce far more offspring than can survive, and that humans too are capable of overproducing if left unchecked. Malthus maintained that actual population growth is kept in line with the growth of food supply by what he cheerfully called the "positive checks" of famine, pestilence, and disease, or by preventive checks, for example, the postponement of marriage. These days, we would include a whole range of contraception techniques in the category of preventive checks.

Malthus was criticized with justification by *social reformers* when he concluded that the poor could not be helped except by an elevation of the death rate or a lowering of the birth rate. *Social reformers* countered that resources could be distributed more equitably for the betterment of humankind. *Social reformers* from the early 1800s to the present day believe that with proper institutional structures, most human ills can be eradicated. This belief has led to experiments with democracy, communism, socialism, and more recently to the widespread application of the doctrine of the market forces.

In the global perspective of our times, the concern for the poor has expanded to encompass the poor of the world.

Social reformers tend to overestimate what the living Earth can supply to meet human demands. Malthus, however, did not understand the concept of overshoot and drawdown and would have expected that shortages would have curtailed human overpopulation before now. Drawdown gives the impression of growing long-term abundance and leads to the expectation that it is possible to provide sufficient food for the burgeoning population. Politicians like to deliver promises of a better life for all and have been inclined to side with the *social reformers*. This preference for growth receives support from most institutions, including corporations, which have been designed for growth, and the major religions.

Scientific observers have a different perspective of time than *social reformers*. *Social reformers* say: "Provide more nurture for the species now." *Scientific observers* suggest:

“Nurture the planet that nurtures the species.” The demands of the *social reformers* are more immediate and direct; the warnings of the *scientific observers* are more long-term and the perceived benefits, indirect.

Malthus had a profound influence on Charles Darwin’s *The Origin of Species* and on Paul Ehrlich’s book, *The Population Bomb*, published in 1968. *Limits to Growth* follows a similar theme.

The Brundtland Report, *Our Common Future*, released in 1987, also known as the report of the World Commission on Environment and Development, responded to the urgent warnings of scientists about environmental deterioration and also proposed steps to improve the human condition and global equity. After a brilliant analysis of the state of the global environment, the Report proposed a strategy for sustainable development based on the three legged stool of economic growth, social equity, and environmental protection.

The Brundtland Report set out the strategic imperatives for sustainable development, including: ensuring a sustainable level of population, increasing equity within and among nations, reducing poverty, reducing the energy and the resource content of growth, reorienting technology, and merging environment and economics in decision-making. Thus the strategy addressed some concerns of *scientific observers* and *social reformers*.

The Report was received with considerable enthusiasm worldwide. It seemed to offer something for everyone. It created a momentum which led to the United Nations Conference on Environment and Development in June 1992 held in Rio de Janeiro (the Rio Conference). The promise was not fulfilled. While economic growth has since advanced strongly, environmental protection and reducing the energy and resources content of growth have lagged far below standards required for the attainment of sustainable development. Equity within and among countries did not advance significantly and in some cases, inequity increased. What went wrong?

An unfortunate coincidence of factors diminished the impetus to implement the strategic imperatives for sustainable development. Between 1980 and 2000, the prices of most commodities fell and the ramping up of production of petroleum from the North Sea created a sense of abundance. This reinforced the belief among some *social reformers* that the market forces would bring about more efficient production and increase the wealth for many, a belief then in the ascendance with the strong backing of the governments of the United States of America and the United Kingdom. However, with the exception of economic growth, the market forces have not met the strategic imperatives for sustainable development. Despite the best intentions and all the fine work of the World Commission on Environment and Development, the response to the warnings of the *scientific observers* has turned out to be inadequate. In retrospect, it is as if the two polarities flew apart after the Rio Conference. The pressure to keep them together could not be sustained as the discipline, forbearance, and innovation required to meet the concerns of the *scientific observers* gave way before the demands of the *social*

reformers for the more immediate gratification anticipated from the liberal application of the forces of the market economy.

Furthermore, the strategy proposed by the Brundtland Report made some optimistic assumptions following the propensity for *social reformers* to expect more from the Earth than it can provide sustainably. Based on subsequent events, these assumptions are probably incorrect:

- The Report called for a massive increase in global economic growth between 1987 and 2070 (perhaps as much as an eight to twelve fold increase) to improve living standards worldwide and social equity. Even though the Report called for major advances in the efficient use of natural resources, it is unlikely that the ecosphere could support an eight to twelve fold increase in economic growth without severe deterioration, reducing long-term carrying capacity.
- The strategy of the Report took an oblique approach to overpopulation by proposing as solutions the education and empowerment of women and economic growth to trigger the demographic transition to lower fertility on the assumption that rising prosperity lowers fertility rates (the demographic transition theory). While the education and empowerment of women is a laudable goal, it is a remarkably indirect way of addressing overpopulation. Also, some evidence suggests that the demographic transition theory may not work. For example, Saudi Arabia had enjoyed great wealth derived from its extensive petroleum resources for over half a century, providing a high standard of living for its population, yet its population has grown rapidly, rising from 3.2 million in 1950, to 26.4 million in 2005, on its way to a median projection of about 59 million by 2050; all this in a country with very little fresh water. While it is true that Saudi Arabia has antiquated social policies, this example demonstrates that cultural as well as economic factors determine fertility rates. Some might object to the example of Saudi Arabia arguing that its repressive social policies especially regarding the treatment of women are the major reason for its rapid population growth. For them, the United States may provide a more compelling example. It has enjoyed great prosperity for many decades and a good system of public education, but since 1950, its population had doubled. While it is true that some of that growth has come from immigration, much of it has not, and the overall bias for economic growth and the expansion of human numbers remains intact.
- The Report may have underestimated the dangers of the global population increasing from about 5 billion in 1987 when the report was released to the expected 9.1 billion in 2050; population growth may not only outstrip economic growth in critical regions but also make the education of women and improved health care very difficult if not impossible.

A recent initiative of the United Nations provides another example of bi-polar thinking. In 2000, the United Nations set out the Millennium Development Goals which built on the perspective of social reform. The goals are: to eradicate extreme poverty and hunger;

achieve universal primary education; promote gender equality and empower women; reduce child mortality; improve maternal health; combat HIV/AIDS, malaria, and other diseases; ensure environmental sustainability; and, develop a global partnership for development.

Reflecting on these goals, it is likely that they will initially add to population and not reduce it. It is reassuring that “ensure environmental sustainability” has been included as one of the goals. However, similar statements have been made in recent decades, and, overall, environmental conditions are worse than ever.

In support of the Millennium Development Goals, a Millennium Ecosystem Assessment Study was undertaken to provide a sound scientific basis for future human development. This Study was published in early 2005 and it presented some sobering information. It states that humans have changed ecosystems more rapidly and extensively in the past fifty years than in any other period. Some sixty percent of ecosystem elements supporting life on Earth, such as fresh water, clean air, and a relatively stable climate, are being degraded or used unsustainably. According to the Study, the situation could become significantly worse during the first half of this century.

To give the Report a positive spin, the Board of Directors of the Study stated that “the overriding conclusion of this assessment is that it lies within the power of human societies to ease the strains we are putting on the services of this planet, while continuing to use them to bring better living standards to all.” The Board also said that “achieving this will require radical changes in the way nature is treated at every level of decision-making and new ways of cooperation between government, business, and civil society. The warning signs are there for all of us to see. The future now lies in our hands.” Perhaps!

The UN Millennium studies may be too human-centered. They imply that other life forms have little value in themselves other than their ability to fulfill human needs and to satisfy human narcissism. It seems that the messages of the science of ecology have yet to permeate human awareness and human institutions. We are still struggling to reconcile the different perspectives of the *scientific observer* and the *social reformer*, and to bridge the polarity wired into our brains.

The effect of serotonin on human behaviour is another likely genetic barrier shaping our responses to environmental threats. Serotonin is made from the amino acid tryptophan. The human body cannot make tryptophan, and must obtain it from dietary sources. Research has shown that tryptophan deprivation alters brain chemistry and mood. In the human body, serotonergic neurons act like the thermostat of a house to maintain a comfortable equilibrium. There is a diversity of serotonin levels in primate populations. Researchers have discovered that animals with higher serotonin levels are more stable, confident and enjoy more social status. Those with low levels of serotonin tend to have greater sensitivity to rewards and risks in their environment but are more irritable and inclined to lash out at other animals. The low serotonin primates have a role in the group,

since their restless, exploratory behaviour helps the group to find new food sources and to avoid dangers.⁴

Applying the finding of this research to the human context, it is likely that our leaders have high serotonin levels that make them confident. They are also likely to discount warnings of extreme danger, for example, the recent prediction by James Lovelock that, by the end of this century, climate change will render the planet largely uninhabitable leaving a few people scratching for a living at the poles. In human groups there is a tendency to reward moderates and to put trust in those who might respond to a warning with the words: "Oh, it's not so bad." In this case, a leader takes the role of playing down the threat of environmental variation which few people want to experience. Therefore the emotional bias favours the denial of the problem.

Yet another hurdle to timely human response to environmental threats is active repression. All brains, including the very simple integrative mechanisms in bacteria, receive a diverse array of inputs that must be combined in such a way to produce a very much smaller set of behavioural outcomes. Since humans are very sensitive and intelligent, our senses bring in too much information, which threatens to overwhelm us. This triggers the active repression of many thoughts especially of those that terrify us, such as the prospect of overshoot and die-off. And the ability to repress successfully is probably tied to higher levels of serotonin.

So we will have to become much more aware of our genetic biases if we are to respond adequately to environmental threats and to overshoot.

Incremental Change

For most of human history, change in the relationship between humanity and the rest of life was sufficiently incremental that the consequences went largely unnoticed? By the early twentieth century some of the negative consequences of the Industrial Revolution began to creep into the consciousness of a few observant individuals, but problems were viewed as local rather than as global and systemic. Access to supplies of stored solar energy in the form of fossil fuels unleashed great prosperity but the long-term environmental implications were largely ignored or denied. Easy wealth has blinded much of humanity to the full scope of the risks posed by drawdown and overshoot. An insatiable human craving for more of everything has given rise to a cornucopian myth, a euphoric belief in limitless resources, and strengthened anthropocentric tendencies.

The accelerating drawdown of natural resources is a product of the same mindset that favours living on credit and building debt. For a while, life appears to go on as usual but soon the bills have to be paid. This is especially true of environmental debt where a conceptual clearing of the books cannot occur.

Narcissism, the Need for Self-Esteem, and Utilitarianism

The abuse by humans of other life forms is tied to how humans perceive themselves.

In his book, *The Denial of Death*, Ernest Becker describes some of the key motive of human behaviour is the need for self-esteem.

“...what man needs most is to feel secure un his self-esteem....His sense of self-worth is constituted symbolically, his cherished narcissism feeds on symbols, on an abstract idea of his own worth, an idea composed of sounds, words, and images, in the air, in the mind, on paper....When you combine natural narcissism with the basic need for self-esteem, you create a creature who has to feel himself an object of primary value: first in the universe, representing in himself all of life.⁵”

This narcissism and sense of human primacy are inherent in the concepts expressed in the Book of Genesis that man was created in the image of God, shall have dominion over and subdue other life forms, and multiply and replenish the Earth with his own kind.⁶ Enshrining our deepest longings in religious doctrines has the effect of justifying our instinctive behaviour and emphasizing narcissism. Clearly, the desire to fulfill this need represents an exaggerated and misplaced self-esteem. It must be confronted to preserve the health of the ecosphere, the foundation of all life.

The term, utilitarianism, enshrines human narcissism in the more dignified philosophical language of The Age of Reason, giving it an objectivity and acceptability it does not deserve. It grew from the work of Jeremy Bentham (1748-1832) and John Stuart Mill (1806-73) who were locked into the anthropocentric perspective responsible for overshoot. The key principle of utilitarianism is that good acts are those which produce the greatest happiness for the greatest number of people. Happiness is construed in terms of the intrinsic worth of pleasure. Clearly, the desire to increase human happiness by material means has led to the decimation of many other forms of life to the point where the integrity of all life is under threat.

Denial of Warnings

The denial of overshoot is rooted in various emotions such as, greed, the fear of a harsher future, and the desire to continue the momentum of existing financial, political and social structures that are designed to promote the growth of human numbers and human consumption. The very idea of shrinking the human footprint on planet Earth is equated with death, with the unconscious fear that if we and our communities are not expanding, we are dying.

Many if not most participants in the market economy deny the need for environmental regulations that would restrict the use of natural resources. With its focus on meeting

short-term human needs, the market economy involves an intense competition for capital, and rewards those who achieve rapid economic growth. With their financial power, large corporations can defer change by using political influence, often to their long-term disadvantage. For example, the opposition of American automobile companies to higher fuel economy standards in the United States has hurt them in the medium- and long-term. European and Asian companies have filled the gap and gained a competitive advantage by developing more fuel-efficient vehicles.

The attacks by vested interests can be vicious. When Rachel Carson's *Silent Spring* was published in 1962, she not only made a strong case against the use of DDT but questioned the indiscriminate use of chemical poisons and the basic irresponsibility of an industrial, technological society towards the natural world. In the final months of writing *Silent Spring*, Rachel Carson had terminal cancer but this did not stop her opponents who made every effort to suppress and vilify the book and who attacked Carson's standing as a scientist. She was prepared and countered her well-funded opponents who comprised chemical companies such as Monsanto and the National Agricultural Chemicals Association, as well as government departments, the Nutrition Foundation and even baby-food producers.⁷

The often irrational and misleading opposition to timely warnings should come as no surprise to persons associated with The Club of Rome. After its publication in 1972, the findings of *Limits to Growth* were subjected to concerted attack and distortion which perpetrated the false public impression that this milestone work made excessively dire predictions that the world would suffer from imminent shortages of critical raw materials. Circumstances helped to fuel this misunderstanding. When the Arab-Israeli war of 1973 and the Iranian revolution in 1979 triggered a rapid increase in the oil price, high inflation, and a boom in commodity prices, many associated these events with the eventual shortages predicted by *Limits to Growth*, even though the book makes no mention of running out of oil or of any other specific resource. What it did say was that the continuation of exponential growth of population, industrial output, agriculture, demand for natural resources, and pollution would lead to severe constraints of many global resources by 2050-2070.⁸

When oil and commodity prices went into a twenty-year decline after 1980, *Limits to Growth* became a symbol of failed human attempts to predict the future, especially for those who had invested heavily in anticipation of a steadily growing scarcity of raw materials. This misperception was reinforced by opportunists who resented the growing awareness of ultimate limits to growth as a potential barrier to the expansion of their own personal wealth. It is a tragedy that such a responsible and thoughtful book, prepared with the protection of the public interest in mind, should be maligned so unfairly by the frequent repetition of falsehoods.

Misunderstanding Risk

The short-term perspective that dominates human nature encourages a misunderstanding of the nature of risk. We humans tend to believe that with the passage of time, if an

expected dire event fails to occur, it is less likely to happen. While such a perception is intuitive, it is incorrect in logic. The more time that passes without a possible event occurring, the greater the probability that it will occur sooner rather than later. Examples of this truth include some environmental phenomena such as, drastic climate change, earthquakes, and tsunamis.

Are We Humans Capable of Extricating Ourselves from Overshoot?

We humans are about to discover that the continuation of civilization and possibly our species will require that we address overshoot effectively with the full strength of our reason and emotion; reason to inform human action and emotion to keep us motivated

We face a dilemma. Population growth increases demand and helps to fuel economic growth. If human economic activity does not continue to grow, industrial societies will become unstable, and if human activities continue their current rate of growth, the life support system of the ecosphere will collapse. Logically, it is preferable to rein in growth and to learn how to adapt to the challenges of a shrinking economy before it is forced upon us by environmental catastrophes and chaos. It is symptomatic of our times, that a book written by Howard and Elisabeth Odum, who set out a comprehensive set of policies to guide humanity to a prosperous contraction, has been largely ignored.⁹

As a species, we now have no alternative but to adopt actions that may be contrary to our nature. We need to back off, show restraint, stop killing thousands of species of plants and animals, and curtail our own expansionary drives. If we cannot implement these and similar measures, Nature will most surely do it for us. In fact, Nature may control our numbers better than we can ourselves. Down through the millennia, Nature has removed the sick and the weak from the population indiscriminately thereby improving the overall health of our species and others.

There are many hurdles to overcome:

- Population growth is at the root of human expansion but the subject of population is emotional and taboo. Powerful institutions continue to support population growth.
- Humans may not be sufficiently aware to overcome their genetic predisposition shared by all life forms to expand into any given short-term opportunity regardless of the potentially negative consequences in the long-term.
- The strength of the sexual impulse cannot be denied. If we enter a period of economic decline and have to deal with widespread chaos, contraception will become more difficult to implement and births may increase.
- The individual freedom of choice to have a child pits individual rights against the collective good.
- For the very poor, children are about the only things they get free.
- Humanity as a whole may not be able or willing to respond to the warnings of leading thinkers quickly enough to avoid escalating environmental catastrophes.

- Our brains have evolved to deal with immediate crises and do not deal nearly as well with long-term issues that require sustained attention.

We humans are in a very perilous situation. Some optimists describe it as a bottleneck. Pessimists view it as a prelude to collapse. We seem destined to be cliff walkers, always living on the edge of our maximum psychological and productive capacity. We need to chart our way through a period of extreme risk and create a margin of safety. Can we extend our love beyond our own species to embrace the living Earth as ourselves? Do we have sufficient levels of intelligence, motivation, reason, and discipline to extricate ourselves from this predicament?

We can take some solace from Socrates who said that: “Virtue is knowledge; vice is ignorance,” and he sought to base his conduct on knowledge. From this principle, it follows that that virtue means knowing what should and should not be done, from which Socrates concluded that no one can know what is right and yet do wrong. This core ethic has provided guidance for the exercise of science and reason for millennia, but clearly there is a painful gap between the delivery of new knowledge and its broad dissemination that leads to a change of direction. Given the seriousness of our situation, we have no choice but to apply the best of human qualities to meet the challenge of overshoot which is an unprecedented threat to our species and a danger to life on Earth.

What Can We Do to Mitigate the Effects of Overshoot?

Agree on Key Assumptions

The first step is for world leaders to acknowledge that overshoot will lead to profound changes to all societies. It is possible to mitigate the effects of overshoot by early anticipation and wise choice. The alternative will be a series of crises, followed by collapse and die-off.

Preventive action will not be easy because it will require many people, especially those in the wealthier countries, to consume less and this prospect is not attractive from the political perspective. It will take exceptional political leadership to pilot humanity through what may be the greatest challenge in our history.

Leaders will need to agree on some key assumptions, for example:

- human demands have exceeded the carrying capacity of the Earth;
- overpopulation is central to ongoing ecological destruction, the fundamental cause of growing insecurity, and the prime reason that sustainability remains unattainable;
- human well-being depends on maintaining a favorable ratio of natural resources per person, not on the gross size of the overall economy regardless of population;
- excessive consumption will have to be curbed wherever it occurs.

Leaders Must Inform People

Leaders will need to ensure that people are sufficiently well informed to generate the broad social cooperation essential for mitigating the effects of overshoot. This will require building trust and sustaining it over time, for overshoot is a long-term challenge. Some may suggest that the level of commitment needed will be comparable to mobilization in wartime, but this understates the effort. While wars usually last only a few years, it will require generations to survive the trauma of planetary overshoot and to restore balance to the ecosphere. Nor is the enemy obviously threatening, for we are the enemy and it is our abuse of the living Earth that undermines our survival.

Do the Homework: Think Through the Implications of Overshoot

The transition from an anthropocentric society to one that is more ecocentric will require a revision of human values and institutions. Potential changes must receive in-depth thought and study. Planning functions must be greatly strengthened and scenarios developed to prepare for unexpected emergencies.

The following are examples of issues that require extensive study:

- What must be done to bring human ethics, and laws into alignment with the insights from the science of ecology that nature/the ecosphere are the source of life and value and that ecological integrity is the known blueprint for sustainability? How can ecocentric ethics provide a path to the restoration and attainment of social justice?
- What legal safeguards are required to protect and restore ecosystems, to save species, and to maintain ecological integrity?
- Can democracy survive the end of economic growth? In western democracies, social cohesion has been aided by the promise of a growing economy and by sufficient flexibility to allow persons of merit to rise and prosper. The approach of overshoot will diminish economic opportunities and may give rise to greater dissatisfaction. The challenge will be to make the transition rewarding by providing more social, environmental and spiritual well-being as we face up to economic constraints.
- Globalization, national sovereignty, overshoot, and migration: the phenomenon of overshoot will occur sequentially in various parts of the Earth and this may trigger a desperate flow of migrants from one region to another until the Earth is picked clean. What steps should be taken now to limit such occurrences and to prevent much human suffering and irreversible environmental degradation?
- How can the public be helped to confront and adapt to the likely consequences of overshoot? What is the role of political leadership? The effects of overshoot will require humanity to greatly reduce its impact on the Earth which will involve the

reduction of population and of consumption of material things. This is not an attractive option for most people and therefore it will be unappealing to politicians who strive to meet the hopes and expectations of the majority. However, early and appropriate actions are essential to reduce the severity of the outcome of overshoot. During the past fifty years, political leaders have had a relatively easy time. Peace and prosperity have allowed them to manage a process that essential runs by itself, but major change is coming. The consequences of overshoot will not be business as usual and the population will look to politicians for leadership, creative insights, and solutions.

- What will be the structure and characteristics of institutions that can help people to organize for life and work in a stable or shrinking economy? Can they be designed to meet material, social, environmental and spiritual needs?
- For Canada, what is the optimal sustainable level of human population taking into consideration the following factors: the quality of life to which most Canadians aspire; the carrying capacity of the web of life; the essential needs of biodiversity; the requirement for a continual flow of vital natural resources; the preservation of substantial wilderness areas; and, the global context in which all Canadians live? What criteria should be used to determine carrying capacity?

Address the Issue of Overpopulation Effectively

The international community must come to an unequivocal agreement that a significant reduction of human population is a desirable goal and set a target for a global population of perhaps one or two billion. The population of the Earth reached one billion about 1800, and two billion in 1927, figures that indicate what the Earth supported prior to the widespread and extravagant use of fossil fuels. We have consumed large quantities of the Earth's resources. Ecosystems may be so degraded and accessible supplies of raw materials, so depleted, that even one billion people may be more than can be sustained over the long-term.

All governments should calculate the carrying capacity of their respective countries. In so doing, it is essential that such assessments should take into consideration not only human needs but also the needs of other species. This could be accompanied by a multi-lateral effort with wealthy countries helping poorer ones to determine carrying capacity.

All governments must understand that national strategies to encourage falling birth rates have been a factor in improving human well-being in many countries, including South Korea, Thailand, and China. Appropriate means of contraception should be made available to the poor of all countries. Falling birth rates can provide what is called a "demographic dividend" when having fewer dependent children allows more adults to participate in the workforce, increasing productivity and prosperity. The availability of jobs is a critical factor for the dividend to be realized.

Prosperous countries should make a determined effort to improve the level of education in poorer countries, especially the education of women and children.

If the citizens of countries that are achieving success in reducing their populations are to benefit from their foresight and feel secure, they must not be invaded by illegal migration or military action. Nor should they acquiesce to the advocates of growth within their respective countries by allowing massive immigration. Some political leaders consider that a large population is an indicator of political, economic, and potentially, military significance. Permitting the continual outflow from overpopulated regions deprives them of some of their most competent citizens. It rewards those who multiply without fully understanding the consequences. It perpetuates the myth that unlimited growth is possible. Countries that allow their populations to rise beyond carrying capacity must face the results of their actions or inaction as this will make evident to them very rapidly the need to change their habits and cultures. Meanwhile, they should receive all the assistance required to help them make a rapid transition to lower fertility levels. There is a huge unmet need for family planning. Ultimately, the various peoples of the world will have to assume the responsibility to restore their respective regions into lands of hope. In an overcrowded world, mass migration is no longer a reasonable option to address overpopulation.

The good news is that populations that grow exponentially can shrink exponentially. A few generations of below replacement fertility could reduce the global population to sustainable levels. Below replacement fertility is already a reality in fifty-one countries including China. This trend should be celebrated. Instead the purveyors of perpetual growth bemoan lower fertility rates as they rush to lay waste to what remains of the living Earth.

Place More Emphasis on Ecocentric Ethics

In many cultures, including the globally predominant consumer culture, there is a bias that recognizes ethics only in terms of human relationships but not in terms of the human impact on other forms of life, regardless of the fact that they make human life possible. Consequently, human numbers and demands continue to grow and fuel the deterioration of the web of life on Earth. We humans must develop a greener sense of ethics that involves confronting our instinctive expansionist drives and our disregard for non-human forms of life. We need to develop and apply ecocentric ethics which are grounded in awareness of our place in nature. We need to recognize that the Earth is the only home we have.

Human ethics grow out of our collective experience and are accepted because they help to ensure the survival of the species. Over time ethics evolve to meet changing circumstances. The concept of the interdependence of all life changes our understanding of our relationships with other life forms and our understanding of ourselves. The idea of an individual human, as a being apart, becomes porous when it is clear that each of us is a walking tower of millions of cells and bacteria that sustain us. The concept of the

individual “I” is really “we.” With this in mind, we humans have to consider how our actions, individually and collectively, affect everything else. Each of our actions, however trivial, has an impact on other forms of life. This perspective leads us to an almost Buddhist sensibility. Yet most of humanity and our institutions have not begun to make the required adjustment. It is still “us against them.” It is a flawed and life-destroying ethic that assumes that the Earth exists to provide for our needs and that human priorities come first. It must be replaced by a new life-giving planetary ethos adhered to by all humanity.

Although this paper presents arguments in support of ecocentric ethics, it is crucial to acknowledge the reality of moral pluralism – that our ethical life consists of a number of different principles and values which can conflict and which cannot be reduced to just one.¹⁰ In the words of the philosopher, Patrick Curry:

“..... pluralism remains a distinctly minority view. The reason is simple, if deep: the dominant kind of ethics in the West – from Greek philosophical and Christian religious to modernist humanism – is profoundly monist. Its fundamental premise is that there is a single reference point, whereby, to quote Weber, ‘one can, in principle, master all things by calculation.’ In terms of the logic of this belief, whether this single principle or value is spiritual (God) or material (scientific truth) is secondary, although not unimportant: the former as the ultimate mystery, ultimately cannot be mastered, whereas the latter does hold out the promise of ultimate mastery. Such monism is necessarily also universalist, since if there is only one such principle it must by definition apply everywhere without exception.”¹¹

Monism can lead to intellectual and political terrorism for a belief in a presumptively universally compelling truth gives rise to efforts to apply it universally. Also, monism reflects anthropocentric thinking and a belief that there are no limits since it is virtually impossible to subscribe to a monistic universalism without rejecting limits.¹² Therefore, while it is desirable to redress the present imbalance by adopting a more ecocentric perspective, ecocentrism should not become the basis of a new monism. We humans crave the certainty of monism which can offer us some relief from the often overwhelming insights gathered by our intelligence and sensitivity. However, we will be better prepared if we accept the complexity of a world, much of which is beyond our understanding, and listen with care for subtle signs of change. With ethical pluralism, it is not enough to present the facts of overshoot in a scientifically acceptable manner with the monistic assumption that the validity of this information will be evident to all. Overshoot will have to fight for public attention in the political arena of competing principles and values. Those intelligent enough to perceive the implications of overshoot must be persistent to keep it in the eye of public awareness.

Teach the Children

We can teach children of this and future generations their place in nature and train them to live within what nature can provide. The adjustment to overshoot will be on-going and humankind will have to adapt frequently to stay within the limits.

We can show children by example how to make ethical decisions and to confront the urge to consume excessively. In the wealthy consumer societies, the media condition children to respond to artful advertising messages. They treat human beings as little more than Pavlovian dogs trained to salivate with desire for each new product in the marketplace. The herd reflex of the species builds on these stimuli to create fads of consumption, but surely we humans are more than mechanisms with predictable reflexes. We do have some power of choice.

Perhaps, like Ulysses, it is time to lash ourselves to the mast or block our ears with wax to resist the sirens' song that comes to us with the assault of advertising and with the instinct for the expansion of human numbers and consumption. We need to place more emphasis on ecological ethics and remind ourselves that we are in relationship with everything else on a very precious living Earth.

Since humans have short attention spans and embody many conflicting emotions, perhaps a simple credo could help us avoid the shoals and to find our way home again.

A Credo to Remind Us that We and the Ecosphere are One

I am part of life.

I am dependent on many life forms within and outside me for my integrity.

With each of my actions, I will ask myself, how will this serve all life on Earth, how will it serve other people, how will it serve life in myself?

When I encounter other forms of life and the inanimate parts of the Earth, I will consume only what I need to sustain my self in modest comfort while keeping my needs simple.

With each interaction with other people, I will act to increase the fullness of their lives.

I will look after life within me by gaining self-knowledge, living moderately, and by maintaining a balance between internal needs and external demands.

I shall not fear death knowing that death is part of life, and that many things within me shall carry on after the shadow has fallen.

For life is my cradle; if I do not break it, I shall not want. ¹³

¹ Catton, William R. *Overshoot: The Ecological Basis of Revolutionary Change*. Urbana and Chicago. University of Illinois Press. Illini Books Edition. 1982.

² Ibid, p. 278.

³ Meadows, Donella; Randers, Jorgen; Meadows, Dennis. *Limits to Growth: The 30-Year Update*. White River Junction, Vermont. Chelsea Green Publishing Company. 2004

⁴ Allman, John Morgan. *Evolving Brains*. New York. Scientific American Library. 1999. p. 20 &ff.

⁵ Becker, Ernest. *The Denial of Death*. New York. Simon and Shuster. 1973. p. 3.

⁶ The Bible. Genesis 1, 26; 1, 28.

⁷ Lear, Linda. *Rachel Carson: Witness for Nature*. New York. Henry Holt & Co.. 1997.

⁸ Simmons, Matthew R.. *Revisiting "The Limits to Growth:" Could The Club of Rome Have Been Right, After All*. An Energy White Paper. October 2000. Available on the Web at: http://greatchange.org/ov-simmons,club_of_rome_revisted.html

⁹ Odum, Howard T.; Odum, Elisabeth C.. *A Prosperous Way Down: Principles and Policies*. Boulder. University Press of Colorado. 2001.

¹⁰ Curry, Patrick. *Ecological Ethics: An Introduction*. Cambridge, UK; Malden, MA, USA. Polity Press. 2006. p. 108 & ff.

¹¹ Ibid. p. 109.

¹² Ibid. p. 109.

¹³ Cassils, J. Anthony. *In Search of Spirit*. Unpublished manuscript. 1999.