

## Literature Review

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I started exploring the concept behind sustainable development by looking at the history of development and how it evolved since World War Two. I knew that I had to ask the question what do we want to sustain and how are we going to do it? I thought that I could understand what sustainable development means if I just examined the concept driving development. As it turned out, this path was not sufficient to answer the question, although it does play an important part. I realized that in order to understand the implications of the idea I actually had to go back farther in history to look at how people regarded nature because ultimately how we develop is intrinsically linked to how and why we use natural resources. As natural historian Donald Worster (1994) points out, despite all of our progress over the last two hundred years, we are still dependent on a living planet and the nature of that living planet is that it is ecologically interdependent.

“What we call the environmental movement of the post World War Two era has been essentially a reawakening to the realization that we must depend on other forms of life to survive; we have no other options. Progress has not made our condition different in this respect from that of our remotest ancestors. Being clever and adaptable, we have learned how to make substitutions in our dependencies and to alter the geography.” (p.429)

We have not learned to live without dependencies. We still need to eat food even if we can grow it without soil, and we still need clothing even if we can produce it synthetically, and we still need wetlands and wild places even if we have to recreate them in other places. So, is sustainable development, then just another way that we are learning to be clever and adaptable to the changes and stresses we are experiencing in the present? That people are asking these questions is interesting in and of itself (and particularly from the standpoint of community development,) and does as Worster suggests, indicates that people are reestablishing a connection to nature. How was that connection severed in the first place and what has caused it to resurface now? This is the focus of the following discussion.

Before I continue, though, I feel it is important to note that this discussion focuses almost exclusively on the thought and tradition affecting development from the Western tradition. It is not my intention in the least to displace other cultural viewpoints on development and relationship to the ecology. (And I also believe that over the course of

history there has been extensive co-mingling between cultures and logic systems. But to account for these factors is beyond my ability and warrants study of its own.) This is an essential part of the overall discourse on sustainability and I will explore at least some aspects of this in regards to Native Americans in the next section. I deliberately chose to look at the Western tradition because it has extended itself globally and has now supplanted itself in almost every country of the world feeding an expansionary economic system that is at one time tremendously successful and horribly destructive. Moreover, the specific concept of sustainable development comes from the Western tradition (despite the fact that many indigenous cultures have a philosophical approach to development that embodies many of the principles that this idea is attempting to cultivate).

## **The Age of Reason**

One of the most influential books that I read was Nature's Economy (1994) written by Donald Worster, a natural historian. His insight into how people in the Western tradition have related to nature and how that relationship has shaped their civilisation has had a major influence on my understanding of the evolution of the concept of sustainable development. He traces the origin of the Western view towards nature to two paradigms, the Arcadian and the Imperialist, both of which arose during the European/American Age of Reason. The first part of my paper references Worster's work extensively.

### ***The Arcadian View of Nature***

Gilbert White was a pastor-Naturalist that lived in Selbourne, a small village outside London in the late 1700's. White studied the local flora and fauna of his village almost as a past time. During his life he was able to make a number of observations about what he referred to as the economy of nature. He noted that the landscape was seemingly permanent and stable allowing for individual species and places to perform multiple functions and provide various services for other species. He eventually wrote down his observations in a book that he published in 1789 called *The Natural History of Selbourne*. Gilbert White advocated a simple life in order to restore a peaceful existence with other organisms. Worster describes White's life in detail and suggests that his Arcadian view of nature was probably influence by the changes in agriculture he witnessed in the England countryside during his life. Numerous rural communities were being transformed as "farmers were taught to produce not for themselves but for urban markets."(13)

Although the stability and permanence that White observed was transformed, his ideas lived on long after his death. The book that White wrote became famous upon his death and influenced a number of natural essayists and a growing critique of modern scientists whom they claimed were isolated from scientists and its morals. (19) This also generated a critique of the new industrial society and methods of scientific analysis (which we still see today within the feminist literature, deep ecology, permaculture, and critics of globalization). The first instances of the use of the words *organic* and *holistic*

began to appear in the works of these essayists to describe the ideal Arcadian landscape. Worster claims that this was the beginning of the Gaia tradition still carried on today by such writers as Wendell Berry. A central theme in their writing according to Worster was to reestablish the community as a counter measure to the anonymity produced by industrial society. In Worster's opinion the modern ecology movement stems from the holistic and Arcadian naturalists inspired by White and his followers.

### *The Imperial View of Nature*

Francis Bacon was to the Imperial view of nature what Gilbert White was to the Arcadian view. Bacon, who lived during the 16<sup>th</sup> and 17<sup>th</sup> centuries, wanted to recreate a man-made paradise on earth. He was convinced that through science and human management that this would be possible and man would once again reestablish his Divine rein in God's garden. Writing on the New Atlantis, he anticipated a new utopia in which the "project of modern Western culture and technology was, from the outset, directed toward the transgression of every cultural and natural limit." (Acterhuis in Sachs, 1993:104) One of his longest lasting influences on science was that by using empirical fact (Luhmann, 1990) science would be able to assist man's transcendence out of the natural world. Bacon like others of his time were influenced by the Christian pastoral belief that man is subservient to God, while nature, a horrible beast, was beset to man. The analogy of the shepherd who defends his flocks from "the hostile forces of nature" (Worster, 26) best describes this view. That Bacon and others of his era wanted to improve their quality of life, i.e., develop themselves is completely understandable. It is questionable, though, if they had any idea how the methodology of dominance would evolve by the 20<sup>th</sup> century. Equally difficult to understand is how the Western notion of progress, which ultimately drove the development industry in the latter half of the 20<sup>th</sup> century, was totally removed from the natural world. Why would a people pursue a course of development that would actually destroy the very thing that gave them life?

John Calvin, a French theologian living in the 16<sup>th</sup> century, had a tremendous influence on Christianity. Considered a religious reformer, Calvin questioned the validity of any earthly authority vested in either state or church, arguing that man was directly

connected to God. The Calvinist ideology eventually garnered a large following of people who advocated for personal autonomy without the interference of an earthly authority. (Daly and Cobb, 1989:6) They espoused the belief that only through self-interested or rational behavior would the greatest number benefit. They argued for personal freedoms without the interference of church or state. Daly and Cobb contend that the modern economy based on rational behavior and individualism grew out of the reforms made by Calvinism. This is obviously the same idea expressed in *laissez-faire* and attempts being made today by the World Trade Organization to pass the Multi-lateral Agreement on Investment to eschew all government interference from the pursuit “free trade” among corporations.

Hans Achterius writing on *Scarcity and Sustainability in Global Ecology* (1993) argues that the notion of progress is built on negative attitudes toward nature that he calls the “reign of scarcity”. (105) Thomas Hobbes, who was secretary to Francis Bacon, had a powerful affect on the formation of Western ideology with his theory of power described in the *Leviathan*. Hobbes theorized that all society is based on power relations between individuals and groups.(105) He studied power relations using a comparative perspective. This methodology caused him to consider the idea of scarcity based on the observation that man’s desire was unlimited. Acterhuis demonstrates that although the common usage of the idea of scarcity did not exist until the 19<sup>th</sup> century, Thomas Hobbes was the first to articulate the phenomena of scarcity that connotes a “general condition of humankind.”(106)

In addition to Hobbes, Acterhuis also emphasizes the influence of philosopher John Locke (17<sup>th</sup> century) and credits him with giving society “the modern images of nature and the idea of unlimited progress and growth.”(107) Locke surmised that scarcity was a natural condition between earth and nature and that that condition was absolute. This idea would later drive Thomas Malthus’ theories on population. For Locke, however, progress could allow man to transcend earthly scarcity by learning how to produce more (of course the later developments in thermodynamics would disprove this assumption). Progress than had to mean economic growth and expansion. This led him to theorize that nature did not have value until it had been transformed by man; “that of all the things useful to the life of man, when he divides what in them is purely owing to

nature and what to labour, he shall find that in most of them ninety-nine hundredth were wholly to be put on the account of labour.” (Quoted by Acterhuis:107) Additionally, Locke also purported the theory on the limitation of wealth; that with the advent of a monetary economy, the natural limit on wealth accumulation “disappears because money does not spoil, and wealth can be accumulated in the form of money”. (Daly and Cobb, 1989:38) His logic displaced the idea of concrete wealth in terms of goods or resources with an abstract notion of money. In turn this reasoning has prevailed throughout the modern era. Daly and Cobb write in For the Common Good, that “the concentration on money and the market rather than on physical goods, with the concomitant decision to model itself on the methods (but not the content!) of physics, has been characteristic of the whole of modern economics.”(1989:38)

Initially the Imperial view of nature was steeped in religious beliefs of God but ironically by the 20<sup>th</sup> century it grew into a totally secular view of the world that treated nature as a machine. Worster attributes that partially to Christianity itself which “has been the most insistently anti-natural” of all the religions. Kirkpatrick Sale in the Conquest of Paradise also notes that ..... The implications of these beliefs on the process and development of development are obvious. Worster also mentions another writer, Nicholas Berdyaev, who claimed that (modern) science in fact benefited by the Christian faith by severing man from it emotionally. The Imperial view as Worster describes it was imbued with the Doctrine of the Superiority of Rational Objectivity that necessitated the suppression of all subjective feelings – thus it denied a soul or spirit to non-human life. The idea that nature acted mechanistically was the only rational deduction. Worster argues that “the domination of the earth in the name of a purely secular welfare” (29) eventually became the triumph of modern man.

One of the most influential people in constructing the Imperial tradition by wedding man’s development to the possibility of his scientific achievements to dominate nature, was a Swedish botanist named Carl von Linne, also know as, Linneaus (1707-1778). In his life, Linneaus transformed botany across the European continent. He was most widely known for a book that he published in 1749 entitled, *The Oeconomy of Nature*. In it he establishes hierarchical relationships within nature and especially those that occur in the food chains (this is the precursor to later theories in the 20<sup>th</sup> century of

steady-state systems and ecosystem theory). He writes that “all of animate nature is thus bound together in common interest by the chains of sustenance that link the living to the dead, the predator to its prey, the beetle to the dung on which it feeds.” (Quoted in Worster, 1994:35) Linnaeus made excellent observations for his era but he himself was still influenced by belief in the Divine and logically assumed that man should direct nature for the improvement of his economy. He contradicted his own observations that “an animal of one kind cannot rob those of another kind of its aliment; which if it happened, would endanger their lives or health.” (Quoted in Worster:35) Worster credits Linnaeus with two things: first that his work in plant classification actually helped lead Darwin to discover the Theory of Evolution. And secondly, Linnaeus believed that there was an end-all purpose and function of nature. The latter correlates directly to the imperial view that nature acted as a machine. And if one assumes that nature is a machine, than it can be controlled, understood through rational observation and empirical research. Locke’s theories on scarcity and production confirms the purpose that Linnaeus supposed; nature becomes the method by which man can escape scarcity (and his fear of nature) through increased production and growth thereby achieving Bacon’s vision of the *perfect society*.

### ***Prevailing Thoughts on Nature and the Economy***

Prior to the Industrial Revolution major transformations were occurring in agriculture in order to feed and support the increasing numbers of people moving to the cities. By the 1700’s the role of nature and the environment was largely to supply sufficient land and water resources to meet the growing demand of expansionary agriculture. Jeroen van den Bergh in Ecological Economics and Sustainable Development (1996) looks at the impact of theorists and economists during the 18<sup>th</sup> and 19<sup>th</sup> centuries. He claims that this was the first established a relationship between the economy and nature to occur in modern society. (12)

In 1776 Adam Smith (1723-1790) published the *Wealth of Nations*. Not only did this publication affect the development of the Western economy for centuries to follow, but he also took a largely positivistic approach toward nature assuming that the market would always employ self-corrective measures (“the invisible hand”) in order to ensure

the best distribution of resources (i.e., nature). The work and writings of Linneaus sculpted Smith's view of nature. (Worster, 1994) Which would account for the fact that he assumed that man's role was to direct the course of nature. He did however, in thinking about the effect of the market on society, state his Theory of Moral Sentiment, where he believed that the market was dangerous because it presupposes community values. (Daly and Cobb, 1989:140) This remains a present day contention among many who argue in the Arcadian tradition to return to an agrarian or rural life style; additionally, others argue the merits of self-reliance and self-sufficiency as a counter measure to economic imperialism. Why didn't Smith feel confident that the market would also make corrective measures for social displacement?

David Ricardo (1772-1823), an economist like Smith, had equal impact on modern society and development. At the time he theorized that agriculture would experience decreasing returns to scale over time. This analysis was incorporated into his land-rent theory.....But probably his biggest impact on modern development and resource distribution (which is now horribly inequitable) is the notion of comparative advantage. The basic idea is that a country or a community should produce whatever they are best suited for based on available resources. The way the logic is applied today by institutions like the World Bank and International Monetary Fund is that a tropical country, e.g., Guatemala, should grow tropical fruit instead of food for its people. By selling their fruit abroad they will earn money that they can then buy food from other countries that can grow it cheaper in their area, e.g., for example wheat in the United States. Resultantly, the best and most efficient distribution of agricultural products would arise.

Thomas Malthus (1776-1834,) influenced by Linneaus and Locke, argued that some part of society would always be under the subsistence level. Through his work the ideas of absolute scarcity and natural limits were further cemented in the Western mind. More recently a neo-Malthusian critique has arisen among people concerned by the rising number of global human population growth and the capacity for the earth to support them. Another influential thinker was John Stuart Mill (1806-1873) who was clearly a thinker in the Baconian tradition, presumed that the role of technology was to relax the environmental or natural limits on growth and progress. Finally, Karl Marx (1818-1883)

who is much better known for his discussion on social theory, communism and the politics of the proletariat, advocated the belief first put forth by John Locke, that nature has value only in that it has a function for man.

### **Evolution and Civilisation: The 19<sup>th</sup> Century**

The idea and use of the word development as we use it today first appeared in the beginning of the 19<sup>th</sup> century. Previously during the 18<sup>th</sup> century, development referred to only the biological process of maturation that occurred within an organism that allowed it to unleash its potentialities. But over the course of the 18<sup>th</sup> century, theorists in evolution and economics and historians transformed the biological metaphor of development into a social metaphor through the application of historical analysis to explain the process of unfolding that occurs within historical events. (Gustavo Esteva writing on *Development* in the Development Dictionary, 1992) Karl Marx in particular used the notion extensively in his work to equate the process of human development to the same process that nature undergoes. If nature is viewed mechanistically and can be controlled like a machine, by the same logic so can humans. The use of the words evolution and development were used almost interchangeably as the meaning of development was transformed writes Esteva from something “that moves toward the *appropriate* form of being to a conception of transformation that moves toward an *ever more perfect* form.”(Original emphasis, p.8) This notion of development was concretized during the Victorian Era and then again after World War Two into a project or a program that people could undergo in order to achieve a more perfect state.

By the beginning of the nineteenth century the work of Carl von Linne had been internalized within the Western mind and the Imperial view of nature was firmly rooted in the popular consciousness. Man’s conquest of nature was part of his natural heritage so prescribed by God. Although any number of criticisms can be placed on the thinkers of that era, I can only believe that they were indeed trying to address the problem, challenge and infinite possibilities of human development much as we are today. At any point in history the future is always uncertain and any theories that develop attempt to

explain and bring clarity to the uncertainty are subjective at best. At most they were as naïve then as we are today.

The Age of Reason lasted up to the middle of the nineteenth century. Coming from this tradition were three prevailing theories about ecology that are important to consider because of their affect on the development of modern economic theories, their influence on Charles Darwin, and their role in laying a foundation for how the Western world would approach development (Worster, 1994: ). First, nature was seen as a unified whole that had a singular purpose. Besides Linneaus, the theories propounded by Descartes, Newton and Galileo also helped to establish this line of thinking which attempted to rationalize all natural phenomena much as the natural philosophers of the ancient Greek city-states had attempted. Descartes' influence was especially pronounced because of his use of reductive logic in order to study the whole.

Secondly, every species in nature was assumed to have an assigned role (by God, of course,) and place in the social hierarchy. This led to theories that justified violence and predation as Worster summates: “[a]ll destruction is the means to a continuity of life. Through its dreadful agency comes the possibility for a maximum abundance of species and individuals and such an abundance or plentitude is further proof of God’s benevolence.” (47) This was the principle of plentitude. The third premise regarded man’s role in the web of life that Linneaus had succinctly described. People had come to believe that man’s progress was justified even if a species diminished at his had or at the expense of progress because the web of life (a Divine creation) would withstand any action that man does. The voices of Bacon, Linneaus, and Locke all coalesce in this view.

Hence the Age of Reason finally allowed Western man conceptually, theoretically and almost nearly physically, through the application of the scientific methods developed by Descartes, Newton and others to finally reign (or at least believe that he could) over all matter and nature. As Worster notes (...), ecology itself became a tool for conquest of the living world. Though by now it may appear an afterthought, the Arcadian tradition had not disappeared. It continued to live on throughout the 19<sup>th</sup> century through the work of visionaries like Thoreau (1817-1862) who has influenced every subsequent generation with his writing and romantic view of nature. In fact the Arcadian tradition continued to

grow and by the end of the 20<sup>th</sup> century as I will discuss later has been the source of a growing critique of modernization and economic globalization.

### ***Charles Darwin and his Theory of Evolution***

Charles Darwin lived his entire life during the 19<sup>th</sup> century (1809-1882) but he experienced both the influence of the Age of Reason and was largely responsible for the philosophy of the Victorian Era of Civilisation. Darwin was conceptually rooted both by Carl von Linne's work in botanical classifications and food chains, as well as Thomas Malthus' observations and theories regarding population dynamics and demographics. In 1859 he published *On the Origin of Species* where he first iterated his theory of evolution that survival on earth was determined socially; natural selection of the fittest species occurs through competition. (Worster,1994:157) He described the process of evolution using the previously pagan and Indian symbol of the "Tree of Life" where he put forth the theory of divergence showing the relationship of species that occurs over time and space. In essence his theories showed that man evolved not be the hand of God or Divine intervention but through a natural (almost mechanical) process. (ibid:160) The impact of his theory on society at the time must have been enormous. The gestalt of his evolution theory was obviously more than some devout religious followers could conceive of as the debate over the validity of his theory is still present today. But the implications of his work had a tremendous impact on the field ecology, the nascent field of anthropology, and the belief in the superiority of civilisation (Western civilisation, of course). Darwin asserted that it is natural for the stronger to push out the weaker thus he developed an antagonistic or competitive view of nature.

Combined with Hobbes theory of power relations and hierarchies within society and Marx' opinion that human historical development processes were no different that those found in nature, we begin to see the unraveling of the expansionary or colonial attitude toward development that was a symbol of the Victorian Era. Worster believes that Darwin's biggest influence, though, was that he separated man's progress from the hand of God which led to secular belief and logic systems that still guide the prevailing views on progress today.

### ***The Victorians 1860-1900***

The great conquest of civilization, the Victorian Era, began in 1860 – the year after Darwin's *On the Origin of Species* was published. (That is a totally arguable contention however because the formation of colonies had been a mainstay of European politics since the 16<sup>th</sup> century.) This is significant because in addition to Darwin's exploration of evolution, he was also interested in the phenomena of *savagery* that he had observed throughout his travels. The recently established discipline of anthropology (1850's) was also consumed with savagery, which was reduced to a question of evolution. What is the process of change whereby a group of humans can transcend their savagery and become civilised? (Worster, 172) In the grand Linnean tradition which assumed that there was a natural purpose and course to nature, the general aim of investigation during this era was to discover the general course of human evolution. At the same time Christian missionaries were being sent around the world to in their mind proselytize the wretched and savage beasts and thus do their duty to God and transform all of humanity. The Victorian Era marked the final rush of territorial expansion of the West's colonial fever which had begun 400 years earlier when Christopher Colon found the New World. (see Sale, 1990) The only difference was that now science could support and justify their efforts like never before.

Worster notes that this era was best summed up by Sir James Frayer who claimed that the entire historical process of man, i.e., the singular course of human evolution that the evolutionary anthropologists were searching for, was the "Assent of Man". (172) The Victorian sentiment lingered into the 20<sup>th</sup> century reflected in the theories of people like economist Walter Rostow who published the Stages of Economic Growth in 1960 and Maturama Fukuoka???? Who wrote the End of History in 1989.

It was in the Victorian Era that the social Darwinists first found their voice. They believed that the rich had a responsibility to the poor. Essentially they were trying to imbue a secular science and belief system with the moral righteousness and teachings of the Church. They observed that the increasing application of technology and the dominance of nature during the industrial revolution (which was occurring throughout the

nineteenth century) was actually proving Darwin's hypothesis that naturally the stronger would push out the weak. This reasoning served nicely to justify why, the people of European descent, who were technologically (at least with machinery) more superior at the time, should conquer and subsume all others. If people in other more savage nations couldn't adapt than this was a natural process that signified their inferiority and justified their extirpation.

The Victorian attitude toward nature was similar to that espoused two centuries earlier by Francis Bacon in that they believed their form of civilisation was the best and most rational method to manage nature. It was also during this era, that the Garden City movement and various utopian cities were dreamed of and implemented. Many cities, notably in England and along the US eastern seaboard were experiencing a great deal of decay. One response was to restore vitality to the cities through the addendum of parks and other natural features like street trees. Lewis Mumford played a vital role in popularizing these movements. The idea was that people's social health in the cities could be vastly improved by incorporating natural areas into them. New York City's Central Park was in response to this ideology. Although in no sense could we consider this a resurgence of the Arcadian view of rustic and rural nature based communities, it was an important turning point modern society. These movements had an important effect on planning, along with a simultaneous development of a conservation movement, they signaled that people's relationship with nature was important and that it was far more pivotal than many had led themselves to believe in the two centuries prior. This, I believe, was the beginning of a theoretical perspective on planning that we call sustainable development today.

After the 1870's neo-classical economics became entrenched in the popular thinking and the political apparatus of the Western nations because it best supported the type of expansionary policies that supported colonialism (which was based on extraction economies) and the increasing demand for natural resources by their industries. An important transition, however, occurred in their thinking on scarcity. Where previously economic theorists had assumed a condition of absolute scarcity (Locke), neo-classical economists were now concerned with relative scarcity and natural resource allocation issues. Economists began to look at the physical limits of both non-renewable and

renewable resources. (van den Bergh: ) The guiding principles of their theories were that rationally behaving actors would react to price. Price, is of course, assumed to connote complete information of the availability (or demand) of a resource. This arrangement would allow the optimization of utility or profits, which in turn guarantees the best socially operating economic system. The theory is predicated on the assumption that the markets don't fail. (van den Bergh:13)

## The 20<sup>th</sup> Century Prior to World War Two

The twentieth century is in no way easy to characterize. So many events and transformations have occurred that it even makes analysis of any level complex and nearly impossible. I have obviously limited my discussion to focus solely on the role of the environment and nature and its relationship to society and how we have interacted with it socially and politically in the Western tradition. Even so, there are so many things to consider that the best I can hope to achieve is to paint a picture of the prevailing trends and transformation of ideas. I am still trying to understand why the West developed a world view that accepted the total destruction of nature and a course of economic growth that would enable a few to achieve great wealth at the physical expense of others and their environment. This section will highlight scientific changes in ecology and economics as well as certain social attitudes like the conservation movement before I move into the last section on the post World War Two era into the present.

### *Conservation and Externalities*

Prior to World War Two, global environmental problems had still not surfaced, yet there was a growing opinion that society should conserve wild places. Notably John Muir had a huge impact on the nascent conservationist movement, as did President Theodore Roosevelt's Conservation Program Director, Gifford Pinchet in 1900. (Sachs, 1992:28) In 1915 the Canadian Commission on the Environment stated that "Each generation is entitled to the interest on the natural capital but the principal should be handed down unimpaired." This was an important statement for the time. It both led to

the later principle of intergenerational equity embodied by the Brundtland Commission in 1987; and it has been a principle theoretical premise in the more recently established field of ecological economics.

One influential thinker of the time clearly embodied the Arcadian philosophy: Liberty Hyde Bailey. In 1916 Bailey, who was the Dean of the Agriculture School at Cornell University in New York, published The Holy Earth. Bailey's writing is both frank and poetic. He clearly established a mandate for living simply in harmony and respect for the earth and yearned for society to realize that they were plundering the earth through rampant and wanton use of technology. Thus was the basis of his critique on modern agriculture and its lacunae in values. He advocated a return to simplicity and community values. Wendell Berry is Bailey's counterpart today. I thought Bailey's argument was interesting because it was strongly based in a religious reverence for the earth and argued that if God made the earth then the entirety of nature was hallowed and should be respected by man. The only way man could duly respect the earth was if he chose a humble path and reduced his impact on the earth to a minimum. Not even Gilbert White who was an educated Christian pastor made such arguments.

One, if not the most important ecological theory to come from this period, was the theory of dynamic steady-state ecosystems or climax theory by American ecologist Frederick Clements in the first decade of the 20<sup>th</sup> century. His basic assertion was that species would undergo many levels of succession but ultimately a geographically defined ecosystem would achieve some level of stability – of the type Gilbert White observed – and that this would remain unchanged until a major climate change would cause a major disturbance or upheaval. (Worster, 1993: 137) At the point of climax or stability the ecosystem acted like one super-organism. This hypothesis is similar to Russian scientist Vladimir I. Vernadsky who asserted that the biosphere was actually the sum of all life and thus the biosphere is a single organism. (Vernadsky, Biosfera, 1926) Clements' work and others helped establish the historical belief that nature left alone achieved a certain complex stability or balanced order. (Worster.....) All other things being equal, if man can determine at which point an ecosystem, like a forest, is stable then he should be able to control the vitality of the forest by limiting what he takes from it. The later ideas of sustainable yields and harvests clearly come from this type of theoretical approach.

One interesting thing to come from Clements' observations though, in the tradition of Gilbert White, was a new surge of the critique of modern agriculture that was completely transforming the Great Plains where Clements had made his discoveries. When the dust bowl came in the 1930's Clements and his followers saw how modern agriculture had actually deepened the mal-effects of the natural disaster. They were "inclined to be critical of modern American agriculture, and indeed of much of modern economic development for being so destructive to the order of nature, and by extrapolation their ideal of a 'sustainable' life on the land was one that followed closely the model of the climax stage." (Worster, 1993:38)

An economist named Pigou in 1932 looked at the problem of pollution in cities and was concerned with the ways pollution could affect welfare or production. He proposed a theory of negative externalities, which suggested that pollution generated by one actor, could negatively affect the welfare or production of another actor. Van den Bergh observed that his theory actually inspired a number of policy prescriptions in later part of the 20<sup>th</sup> century that, for example, offer tradable pollution permits in order to regulate the amount of pollution. The economic theory is that if pollution becomes more expensive to produce than the alternative of finding a means of production that doesn't pollute, the firm will be encouraged toward the latter.

## Is Fifty Years Enough? World War Two to the Present

World War Two disrupted everything except the economic pillars of expansion in the United States and the West. The end of the war supremely positioned it to capitalize off the whole endeavour. Ideologically, though, I think the United States was seen as such a symbol of freedom and a society that the rest of the world could look up to that it and all of its policies became something worth emulating. The United States took every advantage to ensure that the rest of the world knew that its form of civilization was not only enviable but was the measure or standard of perfection that they should strive to achieve. This process was aided by the founding of the United Nations Charter in 1947. One of the guiding principles of the charter was to promote economic growth based on per capita income. This measure was a goal proposed by economist Arthur Lewis in

1944. Thus the standard measurement of a country's wealth, the Gross National Product was invested with new meaning as an indicator of their progress toward development. (see Esteva in Sachs, 1992:12)

In 1949 during President Truman's inauguration speech he jettisoned the rest of the world into a direction of economic expansion and integration – the implications of his policies we are only beginning to fully comprehend today. For the first time in international political discourse in the Western nations Truman characterized the majority of the world as underdeveloped and stated that it was the duty of the United States to help the developing countries. The vision of the social Darwinist/Victorians reified. Whether Truman really was a humanitarian or just reacting to the perceived political hysteria of the Cold War is neither here nor there. What is significant is that this speech marked the advent of the modern "Development Era".

The same year that President Truman announced the direction of his new international policy, Aldo Leopold published A Sand County Almanac. Leopold was a German philosopher concerned in the now centuries old Arcadian tradition of how people should treat the land; "A thing is right when it tends to preserve the integrity, stability, and beauty of the biotic community. It is wrong when it tends otherwise." (Quoted in Bernard, ) Leopold brought public attention to the human responsibility toward the land and the importance of having a land ethic. His ideas helped foment the emergence of human ecology in the popular consciousness. They were augmented by other authors such as Fairfield Osborn who wrote Our Plundered Planet (1948); William Vogt, author of Road to Survival (1949); and a series of articles published in Scientific American and compiled by W.H. Freeman in Man and the Ecosphere (1956).

Expansionary economic policies prevailed throughout the 1950's. Government policies were geared almost exclusively toward industrial expansion and economic growth. Keynes??? It was believed at the time that the trickle down effect of this type of growth would most surely lead to human development of even the most fringe groups of people. Koula Mellos in ..... Links the expansionary policies of this time to a type of liberal Hobbesian ideology that expansion would be the key to any environmental problem. (p.) This line of thinking fermented with the work of the now famous liberal economist Walter Rostow who published the Stages of Economic Growth in 1960. He

had a profound influence on institutional development strategies particularly in the United States and Europe.

The devastation that had occurred during World War Two and the decades preceding it had never fully been recuperated before the industrialization of the post war period began to take its toll. Public and scientific consciousness of the problems on the environment and increasingly on human development associated with industrial development and economic growth began to take hold of the public's mind by the 1950's.

### ***“The First Decade” 1960-1970***

“The problem of the underdeveloped countries is not just growth, but development...Development is growth plus change. Change, in turn, is social and cultural as well as economic, and qualitative as well quantitative...The key concept must be improved quality of people's life” – 1962 *Proposals for Action, First UN Development Decade*

The above stated development objective seems so simplistic in retrospect. Of course, development indicates both growth and change. Yet this type of reductive thinking that hails back to the days of the Age of Reason, Esteva argues is steeped in the historical process that excised the economy from society and politics creating an autonomous sphere of influence that economized all aspects of life. It's operating parameters assume scarcity and they are only able to function by removing value from all other social aspects of life. (1992:9) This may seem like an extreme position but then again in the name of progress countless hundreds have been murdered and tortured and force to acquiesce their cultural and traditional heritage in order to assimilate into system of economic growth.

Rachel Carson stunned the Western world in 1962 with the publication of her book, Silent Spring. She was able to collect empirical data that showed the deleterious affect on birds that stemmed from the industrial use and mishandling of the chemical DDT. Worster claims that it was this book that marked the beginning of a slew of literature foretelling the “ecological apocalypse”. (199 :23) Bartelmus ( ) extended

Worster's analysis adding that the public was also largely impacted by several conspicuous pollution disasters during the 1960's. Also, the rise of neo-Malthusian theories on population growth together led to the rise of "doomsday" literature; additionally it contributed to growing numbers of zero or no-growth advocates. Needless to say, Carson's impact on the public was huge and can probably be attributed with helping charge the nascent environmental movement. (Sale, )

The resurgence of Thomas Malthus' population theories hit home in 1968 when Paul Erlich published The Population Explosion. Erlich linked human economic consumption to the natural capacity of earth systems. A surge of people and international institutions like the United Nations became concerned that the growing number of people on the planet would eventually cause a total system collapse and catastrophe of immense proportions. I guess development would be considered a failure at that point. Erlich's theory began anew critique of the values embedded in Western economic and social organization of the bourgeoisie class. (Worster, 1994:356) In retrospect, Mello's links Marx's ideas on individual subjectivity, freedom and equality to the theoretical structures of the neo-Malthusian theorists. (1988:95)

Parallel to the growing environmental movement of the 1960's, major advances were occurring in the field of ecology that were prompted by new theories in chaos and complexity but also in developing a unified theory for ecosystems themselves. These theories, I feel, have a profound impact on the entire notion of sustainability and certainly transformed everything that ecologists had been learning since the time of Carl von Linne and all that followed in his footsteps like Charles Darwin and Frederick Clements. By the 1960's Frederick Clements' theory of dynamic steady-state ecosystem was supplanted by the Odum brothers, Howard and Eugene's unified ecosystem theory. (Worster: 1993:138)

In 1961 MIT meteorologist Edward Lorenz observed the "Butterfly Effect". The basic idea is that a butterfly pushing its wings someplace in China could cause a ripple effect that would result in a hurricane somewhere else on the planet. His studies led to the development of the ecology of chaos as scientists realized the limited efficacy of making long term predictions for any particular species given the uncertainty in the occurrence of external perturbations or other changes coming from a species' own behavioral dynamics. (Worster, 1994:471) The ecology of chaos soon integrated the field

of thermodynamics (and economics) (see Van den Bergh, : ) The second law of thermodynamics, which says that entropy is always increasing, has driven conceptual and theoretical exploration in the areas of time and irreversibility, information, non-linear processes, order and chaos and evolution. (van den Bergh:17) For example, the notion of disequilibrium, (which totally disrupts the logic of Odum’s ecosystem theory) comes from this line of thinking. The reasoning is that self-organized ordered structure stems from disorder in fluctuating or stochastic type of patterns. (ibid.) The second law of thermodynamics influenced Kenneth Boulding’s 1966 work where he tried to describe the earth as “an approximately closed system”. (van den Bergh, :17) He used the analogy, which is now very well know, of Cowboy economics to describe short-term, exploitative, expansionary, human behavior. In the light of the fact that humans reside on what Boulding called “Spaceship Earth” to represent the fact that the earth is finite and an *approximately closed system*, humans would be better to replace their cowboy attitudes with long-term, conservation and more prudent actions.

## The Age of Ecology

### *And They Saw the Earth,*

The second United Nations Development Decade began in 1970, one year after earthlings had seen the *whole* earth for the first time in their existence. The goal of this decade was to eradicate poverty and the primary *modus operandis* was to meet people’s basic needs. The objective as Wolfgang Sachs, editor of Global Ecology (1993), relates it was neither related to environmental quality or health. ( ) He purports that these ideas, though, helped connect human development and progress to the limits of the natural world, much in the same way the neo-Malthusians were doing. The idea of sustainable yields, which is also linked to Odum’s ecosystem theory, comes from this type of institutional policy. Sach’s calls this the global ecosystem approach because the international bodies were very eager to establish a universal solution to the mounting socio-ecological problems.

The environmental movement was in full force and the first International Earth Day was held on April 22, 1970. Sadly, though, development had still not been able to

adequately address the conditions of impoverishment that were still wrecking havoc in the Third World. Moreover, it was becoming increasingly apparent that humans were collectively facing severe (and perhaps catastrophic) environmental degradation as a result of the previous decades of abuse and neglect of the environment in the name of progress. While technology did indeed loosen the natural limits on human expansion, it appeared that there were limits even to that. In Worster's opinion, the sudden acceleration of environmental damage after World War Two was largely the result of scientific advancement. (1994:359)

So in 1972, the United Nations hosted an international forum in Stockholm, Sweden on Humans and the Environment. The outcome of this conference has left many lasting impressions. This was the first time in history that non-government organizations gathered in tandem to the "official" event to hold a counter conference at which time they advocated a new and alternative path for development that would not be based on the colonial expansionary model developed during the 1950's and before. The Stockholm Conference also generated a new level of bureaucracy for the United Nations with the subsequent establishment of the United Nations Environmental Programme (UNEP). One of its first charges was to coordinate and oversee the Global Environmental Monitoring System (GEMS) to assist the nations of the world with the monitoring, research, analysis, and dissemination of significant environmental data. (Tolba, 1982) Two years later, UNEP Director, Mostafa K. Tolba asserted that a path for development that does not meet with destruction must be unveiled. In an address he made at Chelsea College in June 1976, he asked "How can we meet the basic needs of the people without simultaneously destroying the resource base? (ibid.:10)

Another outcome of this conference was the emergence of the theory of eco-development. Maurice Strong, the Secretary General of the UN Conference on Humans and the Environment, was the first person to use this term to mean development that was not based on patterns of economic expansion. (Mellos,1988:60) This grew into a "critiques of economic concentration and political centralisation on the global level and able all a programme of economic and political dencetralisation." (ibid.) His statement was influenced both by increasing social inequality that development workers were observing globally and an increase in environmental deterioration. Finally the ideas of

cultural autonomy and self-reliance were being incorporated into the ideas of social equality. This occurred probably in part due to increasing criticism by anthropologists who were concerned with the impacts of development on indigenous cultures.....<<<Russall Tribunal>>>> The argument was that distinct social identity justifies political autonomy on the grounds of the democratic principle of self-determination. (Mellos, 1988:p. )

The year 1972 marked other important events. The Club of Rome, headed by Donella Meadows, published the Limits to Growth, a staunchly neo-Malthusian argument that human population was growing excessively and it was only a matter of time before the global population would be well beyond the biological supportive capacity of the planetary ecology. They basically confirmed the findings of Erlich's work in 1968 and brought the attention of the world's political and economic institutions to the plight of human population growth. Another publication that came out in 1972 was To Live on Earth by Brubaker Sterling. He examined the five most significant threats to humanity at the time: climate, radioactivity, pesticides, fertilizers, and erosion. His hypothesis was the economic and demographic forces underlay all threats to the environment, i.e., development. In his book he makes the claim that the scientific and medical advances in the recent human past "have given us the means to break the natural checks on population and to support vast populations independently of nature's usual rhythms. It is the combination of numbers and per capita consumption that creates the problem." (9) His ideas were obviously influenced both by Odum's ecosystem theory and the idea of equilibrium and the neo-Malthusian arguments of the day.

One of the leading thinkers and economists in the early days of ecological-economics was Robert Heilbroner. In 1974 he published An Inquiry into the Human Prospect. Herman Daly and John Cobb in their 1989 book, For the Common Good, credit Heilbroner as being the first economist to consider the pressures of the human economy on the biosphere. That Western civilisation had acquiesced its autonomy to the forces of its economy (as Esteva also argued) obviously has created a considerable amount of entropy for us today as Heilbroner brought attention to. The economy is a human invention to distribute and exchange resources. Our society is not supposed to be sub-set to the economy. Because this has occurred, I think that a host of communication

and conceptual problems in talking about the environment have occurred even independently of the fact that nature has been ostracized from Western society. This idea was also present at the 1974 UNCTAD/UNEP Conference on Patterns of Resource Use in Mexico. In the subsequent Cocoyoc Declaration it was suggested that environment and development strategies should emphasize the development of man and not just the development of things. (Esteva in Sachs, 1992:14)

The field of ecology was also changing significantly by 1974 with an increasing attention be placed on chaos theory (Worster, 1994:411) and growing exploration on the connection of complexity theory and ecosystems. Scientists were beginning to discard the earlier notions of ecosystem equilibrium that had prevailed since the time of Frederick Clements and elaborated by the Odums. With the realization that it was impossible to predict the future of any species, complexity theory offered the hope that scientists could study the disorder inherent in chaos to give them new insight into how ecosystems work. A debate grew during the 1970's that continues today within the field of ecology that challenged the assumption of stability and whether nature and every ecosystem wasn't in a constant state of flux and impermanence. One influential article appeared in 1973 in the Journal of the Arnold Arboretum by William Drury and Ian Nisbet who argued that ecological succession occurred forever without progressing in any determinable direction. (Worster, 1994:391)

This is an especially important hypothesis concerning the later concept of sustainable development that appeared in the 1980's. Not only did their hypothesis discount the theories that had developed since Linneaus that nature had a specific purpose, it meant that nature could not be considered even in the remotest possibility like a machine – which meant human control of it would be inconceivable. Thirdly, it counters the meaning of development that grew out of Darwin's work that there was a particular path that humans could take to arrive at a more perfect state. Development, then, could never be a goal; instead it would be an infinite process always determined by the unfolding of events in the present and future never achieving a static or stable plateau.

The United Nations formalized the Basic Needs Approach to development in 1976. Formal development institutions at this time were still concerned principally with the eradication of poverty. The theory at the time was that if people were able to meet

their basic needs like food, water, shelter, and clothing that any negative impact they were having on the environment (e.g., collecting firewood and thereby depleting forests) would be significantly reduced. Additionally, people who had the basic needs met would become more productive and this would serve to eventually help raise their collective living standards. The first time I have come across the use of the word sustainable in relationship to development also is in 1976 in a speech by M.K. Tolba at the 61<sup>st</sup> session of the Economic and Social Council of the United Nations in Abidjan, Cote D'Ivoire:

“We believe, in UNEP, that each nation must accept the responsibility for planning and managing its own development so as to achieve a sustainable balance between its resource, its population and its capacity to meet the needs and aspirations of its people.” (Tolba, 1982:33)

Two other theories had a resounding affect on the emergence of the idea of sustainability, one on development, and the other on the nature of the biosphere. First, E..F. Schumacher wrote Small is Beautiful which was published in 1973. His book advanced the appropriate technology movement as well as numerous development proposals world-wide; and I think, can be said to be a precursor of the more advanced ideas today of regenerative systems and technology (see John T. Lyle or Robert L. Thayer, Jr.). The other is James Lovelock with Lynn Margulis who devised the Gaia Hypothesis. Although Lovelock had first presented his hypothesis at a scientific meeting in 1969, it wasn't until 1979 in a publication called Gaia: A New Look at Life on Earth. The Gaia principle states that all life and the atmosphere co-evolves and that the implications of the theory, if true, would show that “the most fundamental principle of life was not individualistic competition but cooperation and symbiosis.” (Worster, 1994:381) This again dispelled the notion that any ecosystem would ever achieve stability per se if it is understood to be in a constant process of co-evolution. Thayer in Gray World, Green Heart writes that the Gaia Hypothesis “is both a theory for the organizing principle of the earth and a spiritual metaphor.” (199 :186)

The Gaia Hypothesis of course was very much aligned to the philosophy of the Deep Ecology movement that was first articulated by Norwegian Arne Naess in 1973. The Deep Ecologists purported the belief that the self was united with, and not separate from the natural world. (Thayer, 199 :183) The basic tenets of their belief system were

biospherical egalitarianism, local autonomy, and that all life has intrinsic value. This was the spiritual component of their belief and because they believed this they took ecology to a totally different level than it had known in its entire history although some people in retrospect like Liberty Hyde Bailey definitely embodied this belief.

Up to this point, the majority of my discussion has focused on advances made in the field of ecology. I feel that this is essential given my objective to draw out the meaning of sustainability which at its base means that humans have to figure out how to live in such a manner that damages on their natural resource base will not impinge on their survival. But even the question of survival is tricky as the ecology of chaos shows we cannot predict the future for any species and especially for ourselves we cannot predict the future. Everything lies ahead in a plane of uncertainty. The discussion of thermodynamics is also important because if the second law of thermodynamics is indeed a universal truth, than at some point entropy will accumulate beyond the point at which we can survive on the planet. Thus, future uncertainty and knowledge that at some point survival will be mute drive the whole question of sustainability and human survival. For me then, the question is not so much the length of survival as much as it is an ethical posturing of how do we want to live.

What types of social interaction will be acceptable? Do we accept an economic system of our own creation that we know to be the simultaneous cause of underdevelopment and the destruction of diverse parts of the earth's ecology? Is war acceptable? If we are so civilised than do we not have any other recourse to disgruntlement than mass annihilation through technological warfare? Is genocide acceptable in the process of the expansion of a global economic system that feeds the rich what it robs from the poor? Are politics as we know it acceptable? Is the perpetuation of the forced alienation of the first Americans living with reduced rights and privileges tolerable?

## 1980-1990 The Decade that Development Lost and Sustainability Won

By the 1980's the international scope of economic systems and global environmental issues had become a central topic of concern to economists indicated by the rise of

interest in ecological economics. (van den Bergh, 1996) Policy was also increasingly concerned that development had up to that point not met with the necessary efficacy as indicated by a number of policy statements on development that increasingly recognized the connection between society (development), economics, and the environment (Virginia McLaren (1996) calls these the three pillars of sustainability.) At any rate, the experience of the post-Industrial revolution since World War Two had led to greater attention on the physical limits on the available natural resources and presence of air pollution in the world's major cities. (van den Bergh, 1996) During the 1970's and 1980's the idea was also growing that the biosphere actually acted like a sink and was therefore impacted by the process of development. (Auty and Brown, )

Many people reference the emergence of the concept of sustainable development to the International Union of Conservation of Nature World Conservation Strategy in 1980. In 1983 the United Nations convened the World Commission on the Environment and Development led by Norwegian Gro Brundtland, to deal with the perceived problem of integrating the environment with development. "Issues of population growth and concentration, desertification, pollution and resource exploitation continued to be the responsibility of specialized departments while macroeconomic policies focused on the maximization of economic growth." (Bartelmus, :7) The following year, UNEP came up with a new idea to reinvigorate development: People-Centered Development strategies. Development in 1980's was influenced by the idea that if people felt that they did not own the development process, they would have nothing to lose by not participating in any of the nice programs that the north was trying to give them to help them progress and advance themselves. Words like self-reliance, partnership, empowerment, mutuality, participation, equity, and joint-action were frequently injected into the development discourse. This was an ironic, if not blatantly condescending, argument because essentially the North was still blaming the South for why it wasn't up to par with the civilization standards of the West-reclaiming the old Victorian virtues a century past.

*Our Common Future: Together or Not at All*

Finally after four years of research and international conferences, the Brundtland Commission published their final report entitled Our Common Future in 1987. I think their report did to the concept of sustainable development what President Truman's 1949 speech did to the concept of underdevelopment. In this report, the commission defines and talks at length about the idea of sustainable development. It is the most quoted definition and probably one of the most referenced documents in any literature on the subject of development published after 1987. Sustainable development as Auty and Brown write essential "lengthens the temporal dimension of development, concerned as it is in its literal definition with the maintenance of something over time. (1997:1) But what is being lengthened and over what time scale has never been fully answered although some authors have thought extensively about these questions. (see Gale and Cordray, 1994; S. Lele, 1991; R. Norgaard, 1994) In the opinion of Auty and Brown, the Brundtland Commission advocated a global environmental management approach that could be universally applied based on scientific analysis. The 1992 United Nations Conference on Environment and Development was the response to that report in order to create the institutions that could manage, monitor, and research such a universal approach. (1997:11) This was no different than the establishment of UNEP and programs like GEMS following the Stockholm conference in 1972. Wolfgang Sachs argues the "Brundtland Report incorporated concern for the environment into the concept of development by erecting 'sustainable development' as the conceptual roof for both violating and healing the environment." (1992:29) Development, according to Sachs, has long been an hypocritical enterprise that at its root creates poverty in the name of its alienation.

Still, *Our Common Future* did make many important contributions to the dialectic. First and foremost was its emphasis on intergenerational equality stressed in their definition: "sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs." (43) Although this idea was by no means new (the Canadian Commission in 1915 made the same claim and, intergenerational planning has been a normal part of indigenous development for a millenia – Sachs, 1992:33,) it did inject the intergeneration temporal dimension into development planning. This has been one of the harder things for people

to programatize despite the fact that most people agree with the concept in principle. This phenomena accords an entire study of its own but I can only speculate that it is precisely because of the difficulty of predicting future events and the problem of uncertainty, the increased complexity of modern society and conflicting logic systems and values. As Lele argued, “the absence of a clear theoretical and analytical framework makes it difficult to determine if policies can foster environmentally sound and socially meaningful development.”(1991:607)

Probably the most interesting thing to arise from the report is the extensive debate surrounding the nature of sustainability and numerous attempts to define sustainable development. I assume that this means there is not a consensus with the Brundtland Commission that sustainability is just about intergenerational equity in terms of resource allocation and availability. I think that the Commission, in trying to solve or bring clarity to a problem, actually opened a can of worms and helped bring to the surface a number of issues that have been plaguing the development question for the last five decades. For example, Barbier also in 1987 defined social sustainability as “the ability to maintain desired social values, traditions, institutions, cultures or other social characteristics.” (Lele, 1991:9; see also J. Pezzey, 1989; O’Riordan, ???) His definition couldn’t be more antithetically opposed to the Brundtland Commission. Worster also criticized the Brundtland Commission for three shortcomings. First, their definition was anthropocentric; second, it relied on an assumption that people can determine the carrying capacity of the planet; and third, that it “rests on an uncritical, unexamined acceptance of the traditional world view of progressive, secular materialism”. (in Sachs, 1993:142)

Studies in complexity and chaos theories were also achieving a greater degree of sophistication during the 1980’s. By the mid-eighties, some ecologists were beginning to state that ecosystems that Odum had observed do not exist, i.e., there was no internal logic to the ecology that was organized in a series of sub-set hierarchical systems. Rather, they argued, the earth is a composite of interconnected environmental conditions. (Worster, 1994:393) Theories that supported ecosystem equilibrium were challenged by theories of disturbance or perturbation from climatic change. Margarat Davis studied the effect of climate on ecosystem dynamics using short temporal variables and hypothesized

that climate was in fact the key determinant to the instability of organic nature. (ibid.:395) The idea of sustainable yields or harvests based on the assumption an ecosystem reaches parity and can maintain that through human intervention, were completely discarded by California ecologist Daniel Botkin. He argued that the idea of living off the natural interest was totally incongruent with the theories of disequilibrium that state change is intrinsic to nature. (Sandilands in Keil, 1996:127) Later ecological-economist Jeoren van den Bergh, captures the essence of disequilibrium in his definition: “sustainable development is not a fixed state but a balanced, adaptive process of change in a multi-dimensional complex integrated system.” (1996:5)

Worster argues that the notion of biodiversity conservation actually stems from theories of disequilibrium. The concept of biodiversity surfaced in light of the problem of uncertainty and future prediction. Even if uncertainty charged all ecological theory, ecology could and should help retain all declining species and especially those that arose at the hand of man. (417) This is the antithetical argument proposed during the Age of Reason that man did not have to be concerned about the web of life and damage that occurred because it was God’s Divine hand at work.

Herman Daly, an economist who worked for the World Bank throughout the 1980’s teamed up with John Cobb, a theologian, to write For the Common Good in 1989. In it, they make a sound argument for the basis of a moral economy. They do this by deconstructing classical or neo-liberal economics to show its fallacies and antipathy toward social or human well-being. Daly himself had long established a reputation for himself since the mid-1970’s as an advocate for ecological-economics and reorienting the economy toward a social goal and not just for the abstract accumulation of wealth. Together they presented their case because they felt that there was “a widespread recognition that something [was] wrong, that present policies do not work” (355) and in order for humanity to correct its ills it had to address the egregious organization of its economy. They insisted that the role of the economy should be to renew moral capital rather than deplete it (140) and that economics should be embedded in the social system and not the reverse. Now, after more than two centuries, the once obscure notions that had grown out of the Arcadian tradition were surfacing at the top of the public’s attention. Daly and Cobb influenced myriad thinkers on the issues of ecological

economics, social and human welfare indicators, and redirecting modernization toward a more human goal. This book probably more so than others ignited an earnest debate on ecological economics and numerous critiques of the efficacy of development, that despite all of the advocates for alternative development over the past two decades, was still decisively embedded in the same colonial expansionary worldview.

### The Last Eight Years: Will Humanity Beat the Punch Line?

By the 1990's the idea of sustainable development had become a catchphrase and people were complaining that it had been used so widely by so many conflicting people that its meaning was nearly meaningless. (Sandilands in Keil, 1996; Lele, 1991; Gale and Cordray, 1994) Despite whatever it wasn't doing (for sure, global development was as destructive as it had been for the last 45+ years,) it was now clearly becoming inseparable with a critique of modernity, globalization (of the economy and consumer culture) and most importantly economic growth. Lele notes that the debate on the environment and development has actually brought out the understanding that social conditions influence ecological sustainability. (1991:7) While on one hand the 1990's saw an increase in the use and sophistication of alternative (to GNP) welfare indicators (see C. Cobb, 1994; Daly and Cobb, 1989; K. Hamilton in Auty and Brown, 1997); the mainstream had not changed very much.

For those in charge, the sustainable development paradigm had largely been reduced to eradicating poverty, "sustainability" (what ever that means – probably sustained economic growth) and participation. (Lele, 1991) This is exactly the type of institutional thinking that drives the President's Council on Sustainable Development that was commissioned in 1993 by President Clinton to create a strategy for the United States. The reason institutions are hesitant to do anything more substantial theoretical or otherwise are because it would cause them to have to upset the entire order of the economic growth paradigm. This is anathema to most people in charge. The degree to which all decisions and policies and even law would have to be redirected to advance any real degree of sustainability is so large that most people are totally unprepared to deal with it. Catriona Sandilands calls this the "shaking political and epistemological ground"

of sustainability. (in Keil, 1996:125) Ultimately she counsels that because of the problem of uncertainty and disequilibrium in nature, we can never know for sure what sustainability is and in light of that fact we must choose a path that is at the very least cautious and self-limiting. Citing the ideas of Daniel Botkin, she agrees that we must choose a path that minimizes the rates of change on the environment as much as possible.

“Anthropomorphic though this prudence may be (anthropomorphism may be inevitable in politics, even in anthropocentrism is not), it suggests the need to add a new inflection to discourses of limits: we cannot conceive of sustainability as a project of using resources to their (presumed) limits, but must understand that sustainability requires a cultivation of *self-imposed* limit based on a healthy respect for what we cannot know, and for the partiality of what we do know. While not perfect, an attitude of prudence, combined with an active cultivation of multiple (human, situated, partial) knowledges of nature, seems a healthy resistance to both capitalist expansion and capitalist homogenization.” (Author’s emphasis, *ibid.*:130)

Additionally Worster makes a similar argument looking at how the history of nature, and presumably also the history of ecological ideas, teaches us that all changes are not equal because growth and adaptation varies. The issue of uncertainty and inability to predict accurately any change makes it difficult for us to know if what we do now will lead to our death or continued survival.

“The challenge is to determine which changes are in our enlightened self-interest and are consist with our most rigorous ethical reasoning always remembering our inescapable dependency on other forms of life.” (1994:432)

Richard Auty and Katherine Brown, editors of Approaches to Sustainable Development (1997), critique mainstream development in the same vein for ignoring environmental conservation in a meaningful way. They blame the now global maldistribution of monetary wealth that has occurred with neo-classical economics. The paradigm of economic growth has actually created the situation where cultures are becoming increasingly homogenized which means that there is a worldwide loss of traditional knowledge and human diversity. That this is occurring is an indicator of unsustainability. They argue that to make development sustainable requires knowledge of biophysical and ecological processes, lengthened temporal horizon, and a *philosophical basis for the analysis of change*.

By analyzing the literature since 1987 I think that the meaning and debate on sustainable development has basically bifurcated into two streams or worldviews: weak and strong sustainability. (The idea of weak and strong sustainability is borrowed from Auty and Brown, see their discussion on pp 4-6, 1997) Weak or *shallow* (see Naess in Drengron and Inoue, 1995) sustainability refers to attempts to fine tune the economy without making any significant or needed value shifts in order to really question humanity's relationship to the biosphere. This is the neo-liberal or institutional approach that focuses on how they can sustain economic growth using measurements like sustainable yield or harvest to best allocate natural resources. Some design measures like neo-traditional housing models and so forth are also acceptable. This approach completely relies on market intervention. Strong sustainability works toward a rapid reorientation of human and societal values to transform the very essence of their relationship with the biosphere. Daly and Cobb's call for a moral economy is one example and so is the approach Catriona Sandilands advocates above. Strong sustainability is concerned with cultural issues like autonomy, morals and ethical principles.

While not discussing the concept of sustainability in particular, one of the most interesting critiques of modernization, that I think in part helps explain why there is still such a strong emphasis on the shallow approach comes from German social scientist, Ulrich Beck. Most of his work is on the subject of risk and uncertainty. He is concerned with the fact the success of modernity and economic growth has occurred with significant side-effects he calls environment hazards that have the potential of destroying ourselves and our entire planet. Beck calls this the "globalization of side-effects" and he spends considerable amount of time thinking why if this is the case people don't change their patterns of use and abuse. He argues that in light of the scope of environmental hazards and accumulation of risk, the neo-classical economic notion of externalities (developed by Pigou in 1932) is a joke and no longer relevant.

Another social scientist that thinks along these lines is German Niklas Luhmann. One of his assertions is that we need to make conceptual innovations that better reflect our patterns and methods of observation today. (1990) Both Luhmann and Beck have made similar observations that people thinking about problems today are still trying to

analyze them with “old patterns of thought”. (Beck, p.356; see also Cohen, ) Luhmann discusses how the prevailing worldview thinks that if what we do to the environment does not violate a law of nature (this argument goes back to the Age of Reason) then we will be successful. This would of course necessitate knowing what the laws of nature are. Luhmann notes that ecological research now demonstrates that environmental equilibrium is loosely maintained at best.

“Given the serious problems and the high probability of ecological or economic disasters which results from the very structure of modern society, we need a new seriousness in all our concerns.” (1990:231)

He makes another important point on the nature of freedom and contracts. The earlier (and present) logic of the Western nations was that contracts would serve as a check and balance to ensure one’s freedom. But, as the degree by which large-scale catastrophes can occur as the result of risky actions taken by others, the danger “can no longer be absorbed by contracts and payments and it therefore undermines a latent premise of our constitutional liberties.” (230)