

We are the champions. Nothing can hurt us. Really?

A critique of Richard K. Ford's review of Herman Daly's *Ecological Economics and the Ecology of Economics* in *HER 7 (2): 75-76, 2000.*

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Nature is Real

Imagine a world in which there are no humans and in which there is great unrest among the large carnivores. They are tired of their welfare being dependent on the population size of the animals they prey upon, which tends to fluctuate for reasons beyond their control. So they get together and decide to develop innovative techniques which guarantee greatly improved efficiency in locating and hunting food resources, particularly in times of scarcity. This becomes a highly successful project; the carnivores steadily increase their numbers and also, because of the greater availability of food per capita, they become fatter. Life is good. And then their prey begins to dwindle in number, and food procurement failures mount because the predators have become grossly overweight. When life takes a turn for the worse, the carnivores become aware of the fact that there are too many of them and their standard of living is too high. But it is too late, as they have become locked into their new habits and are unable to return to a simpler way of life. There are only two options left: either become extinct or start devouring each other.

This gruesome tale is nonsense, of course, as nature does not work this way. But humans, apparently because their behavioral potential is sufficiently detached from natural constraints, seem to believe that a scenario such as the one described here can be attained without the final consequences similar to the fate suffered by the imaginary foolish predators. Herman Daly (1999), in his *Ecological Economics and the Ecology of Economics*, points out that this is a belief in the impossible, that we are indeed headed for disaster if we continue to let our economic system be guided by standard neoclassical thinking and thereby ravage the planet. Richard K. Ford (2000), in a most distressing review of this book, remains untroubled by this. He ridicules Daly's warnings by saying that all through history fortune-tellers and entrail-readers have always claimed that doom is just around the corner. Consequently — this is Ford's amazing logic — nothing can or will happen to us now. True, prophets throughout our

cultural history may not have been very successful in forecasting troublesome events. Under present circumstances, however, we are discussing conclusions drawn from scientific analyses. Consider just two examples that illustrate the severity of our current predicament:

(a) In *Beyond Growth*, Daly (1996, 57) quotes a 1986 study according to which 25% of the global potential net primary production (NPP) is being appropriated by human beings. NPP is "the amount of solar energy captured in photosynthesis by primary producers, less the energy used in their own growth and reproduction." Obviously just two more doublings of the scale of human consumption would bring the percentage up to 100!

(b) Mathis Wackernagel and William Rees (1995, 15), in their book, *Our Ecological Footprint*, convert the human use of resources to land area needed to sustain that level of consumption. They conclude that, if everybody on this globe aspires to the American way of life, we will need two additional earth-type planets for our life-support. "Unfortunately, good planets are hard to find ..." they add.

Are these findings a cause for alarm? Ford, simply ignoring what other disciplines have to say about the present state of the world, does not think so. He detests ground truth and prefers to fly high in the sky of his economic theory. This is reminiscent of John Dryzek's (1987, ix) Titanic metaphor in his *Rational Ecology* (p. ix): "Many ecologists are aware of icebergs in the vicinity, and seek to convince us that the ship of state chart a course to avoid them. Most economists would be more concerned with ensuring a utility-maximizing arrangement of deckchairs. ..." By the way, regardless of the relative success or failure rate of fortune-tellers, there is compelling evidence for previous falls of civilizations due to environmental problems. Karl Butzer (1980), for example, sees such problems as a decisive factor in various periods of decline during the time of the ancient Egyptian empires. So what we are facing is nothing new. What is different about our present situation, however, is that the problems we are confronted with are not just local or regional, but global in scope and therefore all the more dangerous.

Ford recommends that Daly's book be put on "people's secondary reading list as an example of how intelligent and otherwise well-informed, educated people miss the point." True, *Ecological Economics and the Ecology of Economics* is not Daly's best book, but not because it misses any points, but because it consists of a collection of critical responses to other authors mostly published earlier elsewhere. Consequently, it does not have the coherence of a textbook; nevertheless most major aspects of Daly's concept of ecological economics can still be found in this book. In what follows I will briefly describe some of the salient points of the book, not following Daly's exposition slavishly, but indicating, with

the figures in parentheses after the subtitles, the pages in the book where the author discusses the topic in question. The reader interested in a more systematic presentation of the idea of ecological economics is encouraged to read Daly's excellent earlier book, *Beyond Growth* (1996).

Daly Dissects the Wondrous World of Economics ...

1. The missing optimal scale of the economic system (8-12, 47-55, 62, 89). The scale at which the economic system operates can be described as the simple product of population size times the per capita consumption of resources. Obviously, the size of the impact on the environment thus generated determines whether or not the level in question is sustainable, i.e., whether or not it could be maintained without problems for an indefinite period of time. Now, much of the thinking in microeconomics is dedicated to the question of optimal scales of activities. It is shown that an optimum exists when the marginal costs of producing one more unit (supposed to be increasing with an expansion of the production) are equal to the marginal benefit arising from the same additional unit (supposed to be declining with an expansion of the production). If the activity in question were to grow beyond this level, it would be simply uneconomical. Daly wonders why there is no corresponding macroeconomic concept, i.e., for the economy as a whole. In the gross national product (GNP) everything gets lumped together. For example, expenditures for environmental cleanup operations needed in the wake of polluting activities are treated as a benefit, and not as a cost. Or the export of natural capital, for example, of wood out of clear-cut operations in tropical rain forests, is counted as income despite the depletion of the stock that goes with it. Daly therefore suggests that we should use a cost-benefit type of accounting also at the macroeconomic level, meaning that we should determine the point at which the marginal cost of natural capital reduction is equal to the marginal benefit of man-made capital increase.

2. The economic system as a *perpetuum mobile* (9-16). How is it possible that, at the macroeconomic level, the question of an optimal scale or, alternatively, the question of uneconomic growth, is ignored in mainstream economics? This is because nature in economic theory either (1) does not exist at all, or (2) is thought to be infinitely rich so that any dents made by human activities are negligible, or (3) is regarded as a sector of the economic system just like any other sector. Daly illustrates Case 1) using the famous diagram appearing in standard economic textbooks in which there is a closed circle of flows connecting producing firms and consuming households. The economy is pictured as a system totally isolated from the rest of the world, i.e., with-

out any inputs from or outputs to an environment. This is, in Daly's words, the biological version of the idea of a *perpetuum mobile*. In Case 2) the human economic system is, in accordance with reality, correctly seen as a subsystem within a larger ecosystem, yet the acknowledgment of this fact is elegantly avoided by simply assuming that surrounding nature is practically infinite and that, consequently, any damage done by human activities to its life-supporting services are negligible. Daly compares this with the belief that, with respect to the size of human impact on nature, our world is still practically empty, that we still live in the Stone Age, so to speak. In fact, of course, we live today in a very full world — remember the extent of the human NPP appropriation mentioned above! In Case 3) the world is simply stood on its head. Instead of the economy being a subsystem of nature, nature is a subsystem of the economy! It is a sector from which resources can be imported and to which waste products can be exported, both without limits. There is no concern for what happens in this sector in ecological terms. In fact, it looks as if nature needed the human waste in order to be able to produce resources.

3. The hocus-pocus production function (17-20, 48, 77-83, 90-94). As Daly argues, the way one sees the relationship between economy and environment is a matter of what he calls one's preanalytic vision — we could also say one's worldview. Today we need a worldview that acknowledges the fact that humankind with all its activities is just one part of an entire ecosystem, and that this part has reached a size such that we find ourselves in an already full world. This view of the situation is crucial to our survival because otherwise any talk about sustainable development becomes totally meaningless. Nevertheless, the worldview that regards nature to be a negligible quantity is clearly a dominant one and finds its expression also in the definition of economic production functions. As we recall, such a function describes the economic output as depending on a number of production factors. In many instances the only factors considered are (human-made) capital and labor, as if the economy, in material and energetic terms, were capable of producing everything out of nothing. Daly likens this to the belief that we can make a cake without flour, eggs, sugar, etc. and bake it in an oven that does not need to be heated! A prominent long-time advocate of this miraculous kind of production function was Robert M. Solow, a Nobel prize recipient. Later, he actually added natural resources as a factor, but, as the function had a form suggesting that all factors could be substitutes for each other, it did not really solve any problems. In particular, as Daly argues, human-made capital cannot, in principle, be a substitute for natural capital. If a fish population dwindles we certainly cannot rectify the situation by simply using more fishing boats! (Well, for a while we can, of course, but in so

doing we will not contribute to a positive solution of the problem. Instead we put ourselves into the role of the carnivores in our opening fictional story.) Natural and human-made resources are complements rather than substitutes, i.e., if we want more (less) of the one we also need more (less) of the other. In place of such production functions Daly recommends the use of what Nicholas Georgescu-Roegen called the fund-flow model. Much closer to reality, this model shows that production is in fact a transformation of natural resources into useful products and waste. Remembering Aristotle's system of *causae*, we can now say that the resources constitute the *causa materialis* while labor and capital play the part of the *causa efficiens*. Looking at the situation in this fashion it becomes readily apparent that it is not possible to substitute efficient for material causes.

4. The primacy of the economy over the ecology (34-39). Not surprisingly, if nature is not or hardly reckoned with in economic theory, then to the extent that practice follows theory economic activities will cause environmental damages that do not appear as costs within the accounting schemes of those activities. As we know, this phenomenon is discussed in economics under the heading of "external effects". The problem has been recognized, if not really in terms of environmental damages, then in terms of undesirable social effects (polluted air, for example, causes respiratory diseases). To remedy the situation such external effects must be internalized, i.e., become part of the bill we have to pay for carrying out the problem-causing activity in question. Daly reviews the two now classical approaches to internalization: (a) The charging of a tax according to the polluter-pays principle (according to an idea first proposed by Arthur Cecil Pigou), and (b) the redefinition of property rights such that in a conflict between private citizens, external effects will become part of the ensuing problem-solving negotiation (first proposed by Ronald Coase). Both principles, however, pose difficulties: How do we measure the monetary value of external effects, and who will be in a position to define property rights? This is typical for environmental economics, which tries to extend economic thinking to the environment and by so doing reveals itself as simply treating nature as a sector of the economic system — true to the-world-on-its-head vision mentioned earlier. Still, at least it is acknowledged that this sector is not simply a free source of resources and a free sink for waste, but that something negative may happen in it so that the ensuing costs must become part of our bookkeeping. Daly, of course, favors a different approach, one inspired by ecological economics. The type of thinking that goes with it does not like headstands and, consequently, tries to put everything upright again. This means the primacy of the environment over the economy: First, we define a regional or national limit for human activities in biophysical terms, for exam-

ple, tons of carbon dioxide emitted, and second, within this limit, we let the market distribute emission rights in the form of tradeable permits. As we can see, the issue of such a limit refers back to the question of optimal scale discussed above. In determining marginal costs it may not be possible to come up with reliable or meaningful monetary estimates of the value of depleted natural capital, for example. Biophysical limits, on the other hand, can be derived from the results of scientific sustainability research.

5. Globalization through boundless free trade (22, 43-44, 66-67, 119-125, 128-131). Neoclassical economics admires the idea of a totally unfettered competition within a globalized economic world system. Following the principle of comparative advantage, it is argued that everything will be produced in the country where it is most efficient to be produced. And such efficiency will also result in a minimization of the strain on the environment. Consequently, our ecological concerns will be best served by giving free rein to a highly deregulated system of free trade all around the globe. Daly deconstructs such a belief by pointing out that the concept of comparative advantage goes back to David Ricardo (1772-1823) and, at that time, relied on the international immobility of capital as a precondition.¹ Meanwhile, of course, the free mobility of capital across national borders has become part and parcel of the idea of a globalized economic system. This, however, means that economic activities will locate according to the principle of absolute advantage and not comparative advantage, which is a relative kind of advantage. In other words, capital to be invested for the production of some good will simply move to the place on our globe where it is cheapest to produce that good. This, however, as Daly points out, will have severe social and environmental consequences. Concentrating here on the latter: Imagine a country A in which some kind of environmental protection scheme has been introduced, resulting in higher prices for some products of the national economy. And picture a second country B, in which this is not the case and the same products can therefore be manufactured more cheaply. Country A has now three options: (1) it gives up its own production, (2) it turns around and lowers its environmental standards again, or (3) it introduces a compensating customs duty for the imports from country B. This, of course, goes against the principle of free trade. The usual argument for such trade is that tariffs provide protection for inefficient national economies and therefore must be eliminated. In the case at hand, however, we are not dealing with an inefficient economy, but on the contrary, with an economy that is efficient in terms of ecological economics. Consequently, it is of paramount importance that the function of national boundaries does not get totally eroded within a globalized world, meaning that it is still possible to devise sensible frameworks for national economies by politi-

cal decision-making. Unrestricted free trade undermines exactly this possibility and, therefore, Daly speaks up against it and in favor of a nationalistic economic orientation which lets countries develop a high degree of self-sufficiency and minimize the necessity for international exchange. This, by the way, would also solve the present transportation problems with their disastrous consequences.

6. The virtuality of the money system (135 ff.). As Daly explains, Karl Marx, by using a very simple but illustrative symbolism, showed how the historical development of the use of money led to the exponential growth culture of the capitalist system. In a “primitive” culture, in which money is not known yet, economic exchanges take the form of barter, in which a commodity C is directly exchanged for another commodity C^* . This is written as $C - C^*$. As both sides profit from the exchange, the emphasis is on an increase of the use value of both commodities. Of course, the amount and type of goods that can be traded in this way is greatly limited. The restrictions are overcome with the invention of money, which now serves as an intervening means M for the facilitation of exchange. This situation can be described by $C - M - C^*$. Note that the principle involved is still the enlargement of the use value of the goods in question. The fact that money has an exchange value is of instrumental importance only. Now, with the advent of commercial and later industrial capitalism, things have been turned around, totally in line with what we said earlier about the world being stood on its head. The goal is no longer to better the use value, but to enlarge the exchange value represented by the money, i.e., to use the money to buy or produce a good and sell it at a profit. Therefore we have now $M - C - M^*$, with $M^* > M$. The decisive change is that money as a non-natural entity invented by humankind can multiply itself forever, whereas there are limits to the growth of real goods. Actually, this multiplication is speeded up enormously through a further step, which carries the whole system to an extreme. It is characterized symbolically by $M - M^*$, indicating that we can use money to generate more money without any intermediate step. This is, of course, what happens on today’s financial markets. More familiar to most of us is the growth of money through compound interest and through its creation as credit in the form of book money by the banks. Concerning the latter, Daly (1999, 135) comments: “counterfeiters are sent to jail for making it [the money], but the private banking system can create it out of nothing and lend it at interest.” The present money system has a high degree of virtuality. This can be demonstrated by three kinds of impossibilities:

(1) An attempt to convert all book money into cash would not work, because the bank credits given out are always a multiple of the actual reserves in cash.

(2) All existing money could never be transformed into

real wealth, because, as we said, money can grow indefinitely, while real assets cannot. All the same, or precisely because of this fact, this exerts tremendous pressure on the environment because a person holding surplus money will eventually want to do something other with it than just put it in a bank account, if that other is likely to bring higher returns.

(3) To imagine a society in which each and every member can lend money and live happily on the interest paid by others is just a further illusion of the *perpetuum mobile* kind. Conversely, this last kind of impossibility means that there are always winners and losers; the rich get richer and the poor get poorer, and this is a dangerous cause for social unrest.

... and Ford Amuses Himself

What does Ford make out of all this? Not very much, next to nothing actually. He picks out minor points and prudently avoids a careful discussion of the bigger issues that might question the reasonableness of the orthodox economic theory. It looks as if he simply could not understand what it is all about, which is rather hard to believe. More likely Ford does not choose to understand it. His way out is to ridicule Daly’s argumentation, to say that it is “amusing” to read it. Let us now look at the critical points mentioned by Ford.

1. Daly’s idea of a steady state economy with no growth does not hold up, according to Ford, because it is not possible to determine an optimum level of happiness. This is a curious argument because nowhere does Daly talk about happiness as such. If anybody or anything is to be “happy”, it is the environment. Of course, as outlined above, the steady state concept aims at a level of material and energetic throughput that ensures sustainability of the economic system within the framework of the larger ecosystem.

2. Daly metaphorically illustrates the steady state idea with a library that keeps a certain constant size by accepting new books only against a corresponding sorting out of old books. As it reminds him of book burnings, Ford criticizes this on the grounds of fascism. Who will decide which books should get discarded? This critique is, of course, entirely beside the point, as the library example is simply used to establish ideas concerning the steady state concept. And books could be sold or given away, rather than burned, when space becomes crowded. Admittedly, this may not be a very good example, as, in a global system, to keep the economy at a certain constant throughput level, we cannot give things away to somebody else, we simply have to restrict the scale and/or the impact of our activities.

3. Daly’s unsuccessful search for a concept of optimal scale in macroeconomics leads Ford to surmise that he probably did not read the intermediate textbook on microeconomics right to the end, thereby missing the chapter on general

equilibrium. I am somewhat at a loss to make any sense of this highly derisive comment. Of course, an economy could be in equilibrium at any scale and, conversely, an economy in equilibrium can by no means guarantee any degree of sustainability. So of what use is this concept for the issue at hand?

4. Neoclassical economists usually argue — and Ford is no exception — that any environmental problem can be solved elegantly by the price system. If a resource becomes scarce it will simply become more expensive and, as a result, it will be replaced by something else. Ford forgets that prices reflect the scarcity of resources only relative to their availability within the economic system and not in absolute terms with respect to the environment. Even if the use of a resource would, in fact, be price-regulated appropriately, i.e., ecologically speaking in a sensible way, this could work only for a single resource at a time. In pointing this out, Ford implicitly admits that Daly is right in complaining about the lack of a concept of optimal scale for the overall economy.

5. It is nonsensical, says Ford, to distinguish broad categories of inputs as either substitutes or complements. The situation is much more flexible, he maintains, because our increasing knowledge can find substitutes for anything, given time. This argument, which suggests that in the end we do not need nature at all, is, of course, exactly the kind of misguided belief questioned by Daly.

6. In particular Ford attacks Daly's argument that if man-made capital could be a genuine substitute for natural capital, then the reverse would be true as well. Reversibility does not apply, he claims, because substitution is the result of a price advantage and therefore, there is no turning back. This, however, has nothing to do with Daly's intention at all. What he is getting at is the idea of substitutability in principle. Are substitutes created in a vacuum? No, of course not, any substitute of anything always contains some matter and consumes some energy in being produced. This would seem to be simple common sense and does not require much scientific reasoning.

7. To demonstrate what he perceives as the hopelessly backward orientation of Daly, Ford asks us to imagine him living in the Stone Age. He would have advised his fellow humans to use flint stone sparingly so that something would be left for future generations. In so doing he would have hindered progress because a lowered production of arrowheads would have meant a declining hunting success and perhaps hunger and death for the community. Again, Ford is wide of the mark. His example concerns an "empty world" whereas Daly's warnings are appropriate in a "full world." But Ford does not believe in this distinction, he finds it "amusing," in fact. Who can help him? Besides, the number of arrowheads would not have been very decisive anyway. Today's cultural anthropology recognizes that the concept of "man the hunter"

is ill informed: Except under extreme conditions, such as for the Inuit in the Polar region, the livelihood of foraging societies is or has been secured much more by women's gathering than by men's hunting.

Ultimate Confusion²

In conclusion, maybe Ford's admission that he considers *The Ultimate Resource* by Julian Simon (1981) to be one of the most important economic books of our time helps one to better understand his curious frame of mind. Simon, of course, is the wizard who fits the finite earth out with infinite resources, which explains why he believes that the more people living on this planet, the better. If otherwise intelligent economists really think that Simon's book should be today's bible, then this is surely a justification for Daly's (1993, 24) fear "that ... we economists have become dangerous to the earth and its inhabitants." Daly is modest in saying "we." Of course he means the representatives of mainstream economics.

Endnotes

1. "Ricardo showed how free trade could be mutually beneficial for countries even when there were dramatic one-sided differences in how expensive it would be to produce the same goods in each country. Consider his example of England and Portugal in the eighteenth century. It was cheaper to produce both wine and cloth in Portugal, in absolute terms, than in England. But it was also true that England's cloth industry was — relative to its wine industry — significantly more efficient. England's disadvantage relative to Portugal in cloth production was less than its disadvantage relative to Portugal in wine production. England had a comparative advantage in cloth, Portugal a comparative advantage in wine. Ricardo showed that each country would be better off specializing in the product in which it had a comparative advantage and trading for the other, regardless of absolute advantage" (Daly 1996, 152).
2. Wording used by Daly (1999, 27) in the title of a paper that criticizes Simon's writings.

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Misunderstanding economics is more likely to "hurt" us than is nature: A rejoinder to Steiner's critique

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This is a rejoinder to Professor Dieter Steiner's critique of my book review of Ecological Economics and the Ecology of Economics by Professor Herman Daly. Professors Steiner and Daly share many views concerning their predictions and prescriptions for humanity. Their shared views can be determined not only from their works mentioned above, but also from their other writings, many of which I have recently inspected. Consider the following sentences, which I take to be representative of their views:

"The largely unintended consequences of this race beyond any reasonable limits make themselves felt as an ecological crisis which in its scope and intensity is unprecedented and endangers our long-term survival." (Steiner 1987, 47)

"We are living by an ideology of death and accordingly we are destroying our own humanity and killing the planet." (Daly and Cobb 1989, 21)

Contrary to Steiner and Daly, my views align with those of the late (and great) Professor Julian Simon and can be represented with the following excerpt from his writings:

"In the short run, all resources are limited. ... The longer run, however, is a different story. The standard of living has risen along with the size of the world's population since the beginning of recorded time. There is no convincing economic reason why these trends toward a better life should not continue indefinitely." (Simon 1996, 588)

In a nutshell Steiner and Daly are pessimistic about the future while Simon and I share an optimistic prediction of the future.

Lacking a crystal ball, one must accept the inability to predict precisely the future regardless of whether one's prediction is optimistic or pessimistic. Since much of the dis-

cussion within the literature leading to this rejoinder stems from disagreements concerning the future, perhaps understanding these conflicting views of the future is a logical starting point.

Suspecting that the origin of these disagreements originates from different interpretations of today's world, one approach is to examine these differences. Specifically, consider interpreting the world of today in either positive or negative terms. This forced dichotomy dramatically illustrates the divergences of perspective that is at the core of our differences. If one currently views the world from a negative perspective, I would suspect that one's prediction of the future would also be negative, and obviously generalizing, the converse holds.

When assessing one's current view of today's world the question is whether or not the economy and the environment contribute to our well-being. Specifically, and in order to focus on the topics germane to this exchange, four questions can be formulated:

1. Are stocks of natural resources that contribute to human welfare unduly depleted?
2. Is the world's population too large to be fed and cared for?
3. Are plant and animal species becoming extinct at a rate that diminishes our well-being?
4. Is the quality of air and water employed by humanity unacceptable and degenerating?

Notice that each question is cast in terms of human welfare. Also notice that these questions are framed in the present tense because of the lack of a perfectly functioning crystal ball. By using this tense, comparisons can be made between the present and the past in an effort to remove some of the uncertainty in the process of assessing these environmental concerns. Granted we may not have complete data for perfect comparisons between the present and the past. This difficulty however, is much more of a deterministic process than comparing the present with the future. While some historical data exists, no data from the future is available for scrutiny.

Notice also that each of the above questions is anthropically orientated, or is framed relative to humans as opposed to orienting the valuation process to nature or using some other foundation as a basis of comparing well-being. It is possible to cast questions similar to those above in terms of some non-anthropical base; however, that defeats the implicit task at hand, which is formulating a base from which human well-being can be ascertained. In addition to the tense and anthropical qualities of these questions, each one requires value judgments on the part of those that would proffer an answer. How much depletion of natural resources is too much? What level of "caring for people" is acceptable for the

world's population? Should the rate of species extinction be zero even if that necessitates a substantial reduction of human welfare? And what level of air and water quality is to be deemed "acceptable"? Depending on how one chooses to make these obligatory value judgments, some would assign an affirmative answer to all of these questions, while others embracing different value judgments would reach a negative answer for each question.

Most "main-stream economists" would answer these four questions negatively thereby being reasonably positive about humanity's current conditions. In fact, a negative answer to these may be a prerequisite for being considered a "main-stream economist." Why this optimistic outlook about the state of the world by most economists? Primarily, economists look at what exists compared to what had existed in terms of quantifiable factors that affect people's lives, or what can be called their "standard of living." How long people live, how much food they consume, what portion of their life is spent in leisure activities versus working, and the amount of goods and services consumed per person are some of these quantifiable factors. If these measurable indicators have increased, then the conclusion is reached that humanity has enjoyed an increase in its standard of living, or a rise in the overall welfare level has occurred. In a more general (and certainly not an economically technical) sense, if these quantifiable factors have increased, it can be argued that mankind's general level of "happiness" has increased.

When making comparisons between the present and the past, the choice of a particular time to which the present is to be compared is often critical. For the sake of this discussion, let the historical point of reference be 1750, or a time before the industrial revolution began. This point in time is selected because it predates most of what Steiner and Daly would label as the "evils" (my word, not necessarily theirs) of modern society. Such comparisons have been made by Professor Gale Johnson in a recent American Economic Review article:

"People today have more adequate nutrition than ever before and acquire that nutrition at the lowest cost in all human history, while the world has more people than ever before....Throughout history there have been those who believed that food shortages and famine were the fate of humanity and that the world's population was restricted not by human decision on fertility but by limitations imposed by nature. ... In the last two centuries, and especially in the twentieth century, all this has changed to a remarkable degree" (Johnson 2000, 1)

Most of today's populations do not face hunger, and those that suffer from malnutrition do so usually because of political shortcomings as opposed to resource or economic problems. Much of the world's population enjoys a longer

life span, with more education, medical attention and entertainment opportunities than their ancestors of 250 years ago (see Lomborg 2001a, Chapter 1). Although this condition is not true for all of humanity, nowhere does a substantial portion of those living today exist at a welfare level below that of their predecessors, except in those cases directly caused by their own government, as is the case with North Korea. Without a doubt, differences do exist between countries in all measures of human existence today. However, differences between countries also existed a quarter of a millennium ago. Of course, there are differences in welfare levels between countries today as there were in the past. While differences exist among the nations at points in time, it is clear there has been an improving trend in the human condition over time. This is especially true during the twentieth century and even more so for those countries that nurture high levels of individual freedom.

For humanity, the trends are very positive. Generally, and especially for developed nations, in practically all measurable anthropological indicators of human welfare around the world, life is getting better. This statement is also true for most environmental concerns. Consider the following quote concerning water as one indicator or proxy of the environment:

"And while only 30 percent of the people in the developing world had access to clean drinking water in 1970, today about 80 percent have" (Lomborg 2001a, 6)

Now consider a second quote about mankind and forests as a second proxy for the environment:

"In a 1993 article in The Atlantic Monthly, the science journalist Charles Mann wrote about the six Hudson River counties an hour's drive from the World Trade Center in lower Manhattan. Mann noted, 'When New York State surveyed itself in 1875, [those] six counties contained 573,003 acres of timberland, covering about 21 percent of their total area. In 1990, the date of the most recent survey, trees covered almost 1.8 million acres there, more than three times as much.' Back in 1875, Mann continued, the six counties had 345,679 residents; by 1990 that number had risen to 924,075. In other words, while the human population of this heavily developed area near Manhattan was increasing three-fold, its wooded portion - the zone where nature dominates- went up from 21 percent to 65 percent" (Easterbrook 1995, 13)

A similar story is seen with energy:

"When Britain began industrializing, charcoal was used to make steel. This depleted Britain's forests. The human

mind responded to this challenge by mining for coal. This was hugely profitable as charcoal had become scarce. Over time, the woods of Britain re-appeared as coal became the chief source of energy. Yet this coal did not die out. Soon, Man discovered oil. And Britain found it cheaper to import coal and oil than to dig so deep for it. Today, you can take coal to Newcastle. There is no mining, but there is still coal under the ground. It has not been exhausted. Similarly, there will always be oil and natural gas, for the human mind will come up with alternatives. Even these non-renewable sources of energy will not be completely exhausted, ever. The price of energy will prompt the search for substitutes” (Mitra 2000, 72)

Professor Bjorn Lomborg, the author of *The Skeptical Environmentalist*, presents many other statistics indicating that water, air, soil, health, life expectancy, and other factors that make for a more enjoyable (happier) life have similar trends. Parallel examples can also be found in other recently published books such as: *Through Green Colored Glasses*, *Earth Report 2000*, and *It’s Getting Better All the Time* (see References).

With this kind of evidence available for the reading, why do Steiner and Daly believe that at this moment in time, the long-range trends are going to change direction abruptly? Why do they believe that doom is just around the corner? The answer may be in their prescriptions for humanity. Steiner wants a “new kind of society”:

“The notion of control should become replaced by a notion of creative participation in the adventure of evolution on this planet. It means that we should do less, and do everything more cautiously, and this can happen only in a new kind of society. In other words, we should remind ourselves time and time again that the so-called environmental crisis is not really a crisis of the environment. But a crisis of we human beings” (Steiner 1987, 49, emphasis added)

The insistence that past trends will not continue into the future is necessary if one wants to propose a “new kind of society” with any hope of its implementation. Steiner’s fictitious world filled with large carnivores keeps the illusion alive that doom is pending and is avoidable only by adopting a new kind of society. However, even in his imaginary world of large carnivores, the fallacy in Steiner’s logic is apparent. People are not like other living things, we think, and more importantly we trade. The biologically valid concept of carrying capacity is inapplicable to humans because it assumes the subjects cannot change their circumstances. Humans can and do change their environment. Typically they change it for the better through innovations, discovery, specialization, and trade. When incentive systems are properly constructed and

implemented, most rational individuals will endeavor to improve their surroundings and search for solutions to situations that limit their betterment.

“Both the jayhawk and man eat chickens, but the more jayhawks the fewer chickens, while the more men, the more chickens” (Moore and Simon 2000, 17)

It is important to recognize the tremendously positive effects that the past quarter of a century has had on humanity, and especially that portion of humanity living in societies where legal and social institutions promote individual liberty and ingenuity.

“A central message of this book is that the fruits of a free society are prosperity and wealth. All of the evidence in this book documents that in every material way, life in the United States is much better today with 270 million people than it was in 1900 with 70 million people. Moreover, as we documented earlier, the American people are net resource creators, not depleters — protectors of the environment, not destroyers. Each generation leaves the ecological fate of the planet and our continent in better condition for future generations. Thus, the growth of the American population, which is healthy and wealthy, is a trend to celebrate, not to bemoan” (Moore and Simon 2000, 264)

Given these past trends, and with no compelling reason to suspect a dramatic shift in these trends, why would one be searching for a new kind of society? We are capable of providing a better life for more people, but it’s entirely possible that more people may also not be a valid prediction for the future, or at least not indefinitely. Current demographic research has presented the prospect of the challenge of depopulation.

“Indeed, at the end of the twentieth century, almost half of the world’s population is thought to live in countries characterized by subreplacement fertility...in reviewing the particulars of the current world population situation, it would appear only reasonable to begin entertaining the possibility that, contrary to even quite recent expectations, the subreplacement fertility regimen may come to typify not only particular regions of the world, but of the world as a whole. If that were to occur, the twenty-first century could turn out to be a time in which world population peaked, and thereafter diminished” (Bailey 2000, 66-67)

It is reasonable to question the prophecy of population decline because it is looking into the future without a crystal ball. However, this is not the only source of such a prediction:

"... the massive growth in population began around 1950 and will probably end around 2050. The increase in population is mainly due to the dramatic fall in the death rate as a result of improved access to food, medicine, clean water and sanitation. The increase is not on the other hand due to people in developing countries having more and more children. ... as one UN consultant put it, rather bluntly: 'It's not that people suddenly started breeding like rabbits: it's just that they stopped dying like flies'" (Lomborg 2001a, 45-46)

Popular literature often assumes that population growth will continue unless "nature" brings it under control. Usually one or more of the biblical four horseman of the apocalypse is charged with the task of reducing man's numbers. Perhaps this assumption should be challenged more often since birthrates have declined, without exception, as nations develop.

No, Professor Steiner, I do not think nature will hurt us in the sense you imply. I do, however, believe that humanity will continue to help nature provide us with better lives. It is far more likely that mankind's tendencies to improve our lives will be limited by ill-advised policies through various kinds of social engineering and income redistribution schemes that dampen innovation, discovery, and trade. Such schemes hatch from misunderstanding the advantages of our current institutions. One such misunderstanding is displayed in your statement "All existing money could never be transformed into real wealth ..." Dr. Daly and you arrived at this ridiculousness by starting with probably the world's single most discredited author: Karl Marx. His basic ideas have been rejected by most of the world's intellectuals and academicians as well as by the vast majority of the world's political experimenters. With the fall of the Soviet system, I was astonished to see a reference to his writings, which truly belong in the dustbin of history. Incidentally, why would everyone want to convert all money to real wealth? The primary function of money is to facilitate trade, which is the wellspring of wealth. Such a conversion would signal the end of efficient trading, and therefore the cessation of most wealth creation. (A total conversion could of course occur, however, the rate of exchange of the final unit of money for real goods would not be anything like the early exchange rates.) Also, it should be pointed out that real wealth can grow without limit. To cite just one example, what is the value (a measure of wealth) of the Mona Lisa today? What was its value a hundred years ago, and what will its value be a hundred years from now? By the way, do not forget the contributions to the economy from services that, incidentally, use practically no physical resources.

The subject of global potential net primary production (NPP) is a good example of junk science. Is this measure of

"the amount of solar energy captured in photosynthesis" measured before or after the "green revolution" of the 1960's? How will this index be adjusted to account for the forthcoming improvements in plant yields stemming from genetic engineering? It may be advantageous to remember that Norman Borlaug won the 1970 Nobel Prize for his work in agriculture. He developed a variety of wheat that dramatically increased the world's grain harvest while the amount of solar energy landing on the surface of the planet was constant. I suppose that a substantial difference would be detected in NPP if measured before and after Borlaug's contributions.

Professor Steiner accused me of criticizing Daly's library metaphor "on the grounds of fascism." Actually, "book burnings," my phrase to which Steiner responded with political name-calling, have occurred in Imperial Japan, Communist Russia, Nazi Germany, Islamic Afghanistan, as well as in religious zealot communities in the United States. What all these have in common is not fascism, but rather narrow-mindedness. Trying to organize a society where policy limits growth because "throughput" considerations outweigh increases to human welfare is also a facet of narrow-mindedness.

Dr. Steiner either did not understand, or chooses to ignore, the message in my metaphor concerning flint mining in early human history. His response is undoubtedly politically correct and most likely extracted directly from ecofeminist literature when he dismisses the making of arrowheads because: "... the livelihood of foraging societies is or has been secured much more by women's gathering than by men's hunting." Besides the fact that my illustration was stated in gender-free terms, why does Professor Steiner suppose these arrowheads were made? For art objects? I am not an anthropologist. However the fact that arrowheads were made, thereby incurring a cost in terms of alternative uses of time forgone, means that the arrowhead makers attached value to them. These people could have engaged in other activities like food production, defense, social contracting, or the creation of art. The fact that early man made the arrowheads and that their children's children survived is sufficient grounds for my example to stand. If the tribe had not extracted this resource at the rate they did, but had practiced "sustainable resource extraction" would they have survived? And if they did survive with lower levels of flint extraction, would we, their descendents now endowed with larger flint reserves, be better off today? Sustainable development in this case (as in others) would have been ill-advised. The following passage comes from Becherman's American edition, however, his United Kingdom edition of the same book is appropriately titled *Small is Stupid*.

“During the last few years the fashionable concept in environmental discourse has been “sustainable development.” It has spawned a vast literature and has strengthened the arm of empire builders in many research institutes, universities, national and international bureaucracies, and statistical offices. Environmental pressure groups present the concept of sustainable development as an important new contribution to the environmental debate. It is claimed that it brings new insights into the way that concern for the environment and the interests of future generations should be taken into account in policy analysis. But in fact it only muddles the issues. As two distinguished authorities in this area, Partha Dasgupta and Karl-Goran Maler point out, ‘...most writings on sustainable development start from scratch and some proceed to get things hopelessly wrong. It would be difficult to find another field of research endeavor in the social sciences that has displayed such intellectual regress’” (Becherman 1996, 143)

In addition to mystifying their readers with the term sustainable development, Steiner and Daly demonstrated that they do not understand either the microeconomic idea of optimization or the concept of wealth creation through trade. Optimization is a process to reach a specified goal given some limitations such as a firm’s production process during a particular time period without changing some fixed input. However, macroeconomic analysis is a different process with different objectives. It usually attempts to understand how society can organize itself in such a way as to increase the total amount of welfare for individuals within society. Some societies with an abundance of “environmentalism” and a dearth of consumer goods will gladly trade that which is in abundance for that which is scarce. Societies in the opposite situation will, not surprisingly, willingly trade in reverse. Such a pattern has been observed as nations develop. They readily trade environmental amenities for consumer goods. However as the standard of living increases, these same countries are more willing (and also able in terms of wealth) to assign higher levels of value to environmental concerns. Such outcomes have been empirically varied as can be seen in the work of Dr. Don Coursey of the University of Chicago (Coursey and Hartwell 2000).

Dr. Daly’s arguments against free trade, with which Dr. Steiner seems to agree, overlook the advantages of trade from the consumer’s perspective. The main reason consumers in one country will purchase goods from another country is that the price/quality ratio of those goods is superior to those goods produced domestically. By restricting this trade, these benefits that accrue to the consumers are forfeited (thereby becoming costs to consumers) but are easily overlooked since they are dispersed across the buying public. The benefits that

accrue to domestic workers as a result of blocking trade are more readily identified since the beneficiaries (workers and plant owners) are usually concentrated. However, the net result of these benefits and costs is negative. That is, in total the country loses more than it gains from restricting trade. David Ricardo would most likely not agree that advantages in trade in a dynamic setting would produce the negative effects Dr. Daly suggests. Ricardo used “land” but not geography as one of his inputs in his analysis, which in many cases is an important component of the production process and is obviously not free to move. The argument that free trade merely produces a race to the lowest level of environmental standards is also not substantiated by statistical evidence. As Professor Lomborg has empirically verified, countries with high environmental standards are also ones with more active trading records and higher standards of living.

Upon second reflection, I repeat my original statement that Daly’s book belongs on secondary reading lists. Most of the references to this rejoinder, and particularly the works of Simon, Beckerman, and Lomborg, would make fine additions to anyone’s prime reading list. These works would provide the readers with a clear and accurate view of today’s world from which they can predict the future for themselves.

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Sprawl City: Race, Politics, and Planning in Atlanta

Edited by Robert D. Bullard, Glenn S. Johnson and Angel O. Torres
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Sprawl City is a well-edited volume on the growth of the ten county region of Atlanta, Georgia. This easy to read book employs a multidisciplinary approach to the environmental, racial, and educational concerns of unplanned growth. The twelve contributors represent professionals in various fields: the Director of Georgians for Transportation Alternatives, the founder of Southface Energy Institute, a research associate at the Environmental Justice Resource Center, a GIS specialist in environmental analysis, and professors of law, sociology, and educational policy studies. It is refreshing to read non-academic type authors who provide different perspectives and shed new light on some traditional problems from their hands-on experiences. The publisher is the Island Press, a nonprofit organization that publishes books on environmental issues.

The introduction, a few chapters, and the conclusion are written by Robert Bullard adding to the flow of the chapters

and consistency throughout the text. Good illustrations, maps, and tables are provided to support the text. *Sprawl City* begins with a definition of sprawl, (i.e., random, unplanned growth) describing the fastest growing region in the country, Atlanta. With each chapter, many of the problems and unanticipated consequences of sprawl are described. Usually, growth is viewed as a sign of progress and improvement, yet in this book, sprawl becomes the cancer that spreads throughout the counties uncontrollably. For Atlanta, continued growth is to the detriment of those living in the area ... bigger is not better.

The introduction addresses the various problems of sprawl, gives a historical overview, and speculates on the future of continued sprawl. The ten county metropolitan area of Atlanta has over 3 million people and is expected to increase by a million by 2025. In the 1990's, Atlanta grew more than any other metropolitan area in the U.S. and today is the least densely populated region with only 1,370 persons per square mile (L.A. has 5,400 people per square mile). Most of this growth is occurring in the sprawling suburbs as the boundaries of Atlanta's region doubled in the 1990's and continues to expand. Each week, Atlanta sprawl consumes an additional 500 acres of field and farmland. The authors suggest that sprawl is a threat to the quality of life due to traffic congestion, air pollution, health concerns, deforestation, and increasing residential segregation. Bullard provides many interesting facts concerning the car dependent area and consequences of traffic on the citizens in the region. Each chapter of the book is devoted to certain issues related to sprawl including environmental issues, transportation, housing, residential segregation, education, legal reform and energy use.

Chapter 1 begins with the environmental issues of Atlanta's growth. The environmental assaults of land use, air quality, water pollution, toxic releases and sewage treatment plants are described. Emphasis is placed on how these hazards disproportionately affect low-income and minority populations. While much of the literature on sprawl and environmental costs often neglect the issues of race, Bullard and his colleagues focus on racial disparities, residential segregation, and the educational gap between the races throughout the book.

Topics highlighted in chapter 2 include traffic congestion, the lack of public transportation, the use of federal monies, and future transportation systems. It is made clear that the solution is not merely building more highways, but rather public transportation. These authors state that it is also essential to improve the mobility of Atlanta's poor and people of color. For the readers not familiar with the Atlanta region, helpful maps are included with the economic activity centers and transportation lines. Chapter 3 continues with the problems of transportation and the flawed transportation