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Perspectives

Brother, Can You Spare Me a Planet? Mainstream Economic Theory and the Environmental Crisis

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Abstract

The economic theory that serves as the basis for coordinating economic activities in the global market system and for implementing economic solutions for environmental problems is neoclassical economics. In economic textbooks, the creators of this theory are credited with transforming the study of economics into a rigorously mathematical scientific discipline. But what is not widely known is that neoclassical economic theory was created by substituting economic constructs derived from classical economics for physical variables in the equations of a soon-to-be outmoded mid nineteenth century theory in physics. The mathematical formalism that resulted from these substitutions was predicated on unscientific axiomatic assumptions that remained essential unchanged in subsequent extensions and refinements of neoclassical economic theory. And this explains why the mathematical formalism used by contemporary practitioners of neoclassical economic theory effectively precludes the prospect of implementing scientifically viable economic solutions for a broad range of very menacing environmental problems.

Keywords: Neoclassical economics, scientifically viable economic solutions for environmental problems, nineteenth century physics, international treaties, global warming, post Kyoto agreement, two culture problem.

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1. INTRODUCTION

The causes of the environmental crisis may be staggeringly complex, but the most effective way to deal with it in economic terms seems rather obvious. We must use our best scientific understanding of how to coordinate economic activities in environmentally responsible ways as a basis for implementing scientifically viable economic solutions for global warming and other menacing environmental problems. Virtually all political leaders and economic planners assume that these solutions can be implemented within the framework of the economic theory that now serves as the basis for coordinating economic activities in the global market system—neoclassical economics. And all the proposals that will be considered during the last phase of forging the terms of a post Kyoto agreement on global warming are predicated on this assumption.

In economics textbooks, the creators of neoclassical economic theory are credited with disclosing the lawful dynamics of market systems and transforming the study of economics into a rigorously mathematical scientific discipline. But there are no mentions in these textbooks, or in all but a few books on the history of economic thought, of a rather salient fact—neoclassical economic theory was created by substituting economic constructs derived from classical economics for physical variables in the equations of a soon-to-be outmoded theory in physics (Mirowski, 1988; Nadeau 2003; Nadeau 2006).

A number of well known physicists and mathematicians told the economists who created this theory that the economic constructs were utterly different from the physical variables and there was no logical or scientific basis for making the substitutions. But the economists apparently failed to comprehend how devastating this criticism was and proceeded to claim that they had transformed the study of economics into a scientific discipline. As it turned out, the origins of neoclassical economic theory in mid-nineteenth century physics were forgotten and the claim that the theory is scientific was almost universally accepted.

At this point, allow me to stress that it is not my intention to launch an ill mannered attack on the intellectual or moral integrity of members of the economic profession. There is nothing wrong with using sophisticated mathematical formalism to model tendencies to occur in complex systems, and the formalism used by the practitioners of neoclassical economic theory provides a reasonably coherent basis for coordinating economic activities in market systems. And if one assumes that the only reasonable criteria for assessing the scientific validity of an economic theory are pragmatic and utilitarian, a good case can be made that neoclassical economic theory has passed this test with flying colors.

But as this discussion will demonstrate, this theory can no longer be viewed as useful in even strictly pragmatic or utilitarian terms because it fails to meet what must now be viewed as the fundamental criterion for the usefulness of any economic theory —the extent to which the theory allows economic activities to be coordinated in environmentally responsible ways on a planetary scale. Unfortunately, understanding why neoclassical economic theory cannot pass this test requires some familiarity with a subject that most people are not very interested in and would probably prefer to know nothing more about—the history of mainstream economic theory.

2. THE NOT SO WORLDLY PHILOSOPHERS

The creators of classical economic theory were eighteenth century moral philosophers who were attempting to understand new economic conditions that were altering the balance of power between sovereign nation-states. Markets as a means of exchanging goods had existed from the beginnings of recorded history, but the idea of a market system as a means of maintaining an entire society did not emerge until the seventeenth century. This was a time when the old economic order, premised on custom and command, gave way to a new economic order that was sensitively dependent on the actions of profit-seeking individuals operating within the contexts of national market systems (Heilbroner, 1992).

Since the complex web of institutions, laws, policies, and processes that sustain and regulate production and exchange in modern markets did not exist, the new economic order more closely resembled a buzzing confusion than a rational process. The eighteenth century moral philosophers who created classical economic theory (Adam Smith, Thomas Malthus, and David Ricardo) believed that order lay beneath this chaos and that the ideal model for disclosing this order was Newtonian physics. And all of these figures participated in and were greatly influenced by a widespread philosophical and religious movement in the eighteenth century known as Deism.

The fundamental impulse in this movement was to make belief in the existence of God consistent with the implications of the mechanistic world view of Newtonian physics. Since this physics assumes that physical laws completely determine the future state of physical systems, the Deists concluded that the universe does not require, or even permit, active intervention by God after the first moment of creation. They then imaged God as a clockmaker and the universe as a clock regulated and maintained after its creation by physical laws.

Smith, Malthus and Ricardo believed that this Deistic God created two sets of laws to govern the workings of the clockwork universe—the laws of Newtonian physics and the natural laws of economics (Nadeau 2003: pp19-36; Nadeau 2006: pp102-123). And they also believed that the natural laws of economics legislate over decisions made by economic actors in much the same way that Newton's laws of gravity legislate over the movements and interactions of material objects. Adam Smith imaged the collective action of the natural laws of economics as an "invisible hand," and this hand in his view was that of the providential but absentee Deistic god (Ingrao *et al.* 1990).

In *Wealth of Nations*, Smith said that the invisible hand is analogous to the invisible force that causes a pendulum to oscillate around its center and move toward equilibrium or a liquid to flow between connecting chambers and find its own level. Based on this analogy, Smith claimed that this unseen hand is the force that moves independent actors in pursuit of different values toward the equalization of rates of return and accounts for the tendency of markets to move from low to high returns. Given that Smith's invisible hand has no physical content and is an emblem for something postulated but completely unproven and unknown, why did he assume that it actually exists? The answer is that Smith was a Deist and his belief in the existence of the invisible hand was an article of faith.

The physics that the creators of neoclassical economics, all of whom were trained as engineers, used as a template for their mathematical theories was developed from the 1840s to the 1860s. During this period, physicists responded to the inability of Newtonian mechanics to account for the phenomena of heat, light, and electricity with a profusion of hypotheses about matter and forces. In 1847 Hermann-Ludwig Ferdinand von Helmholtz, one of the best known and most widely respected physicists at this time, posited the existence of a vague and ill-defined energy that could unify these phenomena. This served as a catalyst for a movement called "energetics" in which physicists attempted to explain very diverse physical phenomena in terms of a unified and protean field of energy.

Because the physicists were unable to specify the actual character of this energy and could not be precise about what was being measured, their theories were not subject to repeatable experiments under controlled conditions. The amorphous character of energy in the physical theories also obliged the physicists to appeal to the law of the conservation of energy which states that the sum of kinetic and potential energy in a closed system is conserved. This appeal was necessary because it was the only means of asserting that the vaguely defined system described in the theory somehow remains the "same" as it undergoes changes and transformations (Mirowski, 1988: pp. 19-20).

The strategy used by the creators of neoclassical economics was as simple as it was absurd—they wrote down the equations of the mid-nineteenth century physical theory and substituted economic variables for the physical variables. Utility was substituted for energy, the sum of utility for potential energy, and expenditure for kinetic energy. The forces associated with utility-energy were represented as prices and spatial coordinates described quantities of goods. In the mathematical formalism that resulted from these substitutions, the economic actor is presumed to operate within a field of force identified, in both figurative and literal terms, with energy.

In an effort to justify the claim that the resulting formalism could disclose the hidden dynamics of a market system, the economists argued that this system, like the physical systems described in the equations, is closed. The economists also claimed that the sum of utility in a market system, like the sum of energy in the physical theory, is conserved. None of these now famous economists seemed to realize that the sum of income and utility in an economic system is not conserved and that the conservation principle is quite meaningless in any real economic process. Nevertheless, this assumption serves to legitimate the existence of the invisible hand in its current form—constrained maximization in general equilibrium theory.

After concluding that utility, like energy in the equations taken from the physics, is conserved, the economists were obliged to conclude that production and consumption of goods and commodities are physically neutral processes that do not alter the sum of utility. In an attempt to explain why this is the case, the economists arrived a very strange interpretation of what was then regarded as a self-evident truth in the physical sciences—the law of the conservation of matter or the idea that matter cannot be created or destroyed. If matter, said the economists, is immutable, then the production of goods and commodities cannot alter or change the basic stuff out of which they are made. They then argued that any value that accrues as a result of production and distribution of goods and commodities can only reside in the mental space of economic actors.

This was the origins of two assumptions that are foundational to neoclassical economic theory and embedded in the mathematical formalism used by mainstream economists:

(i) Economic actors interact within a field of force (utility) in which the natural laws of economics legislate over their economic decisions and determine the value of goods, commodities, and services; and
(ii) The value of these goods, commodities, and services circulates in this field as capital in a closed loop from production to consumption in a domain of reality which is separate and distinct from other domains.

This misalliance between economic thought and mid-nineteenth century physics explains why the economic theory used by virtually all mainstream economists is predicated on the following assumptions:

- The market is a closed circular flow between production and consumption with no inlets or outlets.
- Market systems exist in a domain of reality separate and distinct from the external environment.
- The natural laws of economics act causally on economic actors within closed market systems and these actors obey fixed decision making rules.
- The natural laws of economics, if left alone, will ensure that closed market systems will perpetually grow and expand.
- The unimpeded operations of the natural laws of economics will result in the perpetual expansion of these systems.
- Environmental problems result from market failures or incomplete markets.

- The natural laws of economics can resolve environmental problems via price mechanisms and more efficient technologies and production processes.
- Inputs of raw materials into the closed market system from the external environment are "free" unless or until costs associated with their use are internalized within the system.
- The external resources of nature are largely inexhaustible, and those that are not can be replaced by other resources or by technologies that minimize the use of the exhaustible resources or rely on other resources.
- The external environment is a bottomless sink for waste materials and pollutants.
- The costs of damage to the external environment by economic activities must be treated as costs that lie outside the closed market system, or as costs that are not included in the pricing mechanisms that operate within these systems.
- These costs can be internalized in the closed market system with the use of shadow pricing and the establishment of property rights for environmental resources and amenities.
- There are no biophysical limits to the growth of market systems.

Obviously, all of these assumptions are fundamentally wrong in scientific terms. In these terms, markets are open systems that exist in embedded and interactive relationship to the global environment, and there is a very definite relationship between economic activities and the state of the natural environment. Natural resources are clearly exhaustible and our over-reliance on some of these resources, particularly fossil fuels, could soon result in irreversible large-scale changes in the global climate system. The natural environment is not separate from economic processes, and wastes and pollutants from these processes are already at levels that threaten the stability and sustainability of virtually all environmental subsystems. Last but not least, the limits to the growth of the global economy in biophysical terms are real and inescapable, and the assumption that market systems can perpetually expand and consume more scarce and nonrenewable natural resources is utterly false (Nadeau, 2006: pp. 81-145).

A number of theoretical economists have argued that assumptions about the lawful dynamics of market systems in neoclassical economic theory are fundamentally flawed (Leontief, 1981; Shubik 1982; Aubin, 1998). But the vast majority of mainstream economists in both business and government are not terribly concerned with the most advanced theoretical work in their discipline. Legions of these economists are engaged on a daily basis in developing analyses and making predictions that guide the decision-making of political leaders and economic planners. Most of these individuals are aware that the resulting economic activities could have destructive environmental impacts and seek to minimize these impacts. But these good intentions are largely ineffectual because the mathematical theories used by the economists preclude the prospect of realistically assessing the environmental impacts of economic activities in monetary terms.

3. A GREEN THUMB ON THE INVISIBLE HAND

The practitioners of neoclassical economic who specialize in developing economic solutions for environmental problems are called environmental economics. This orthodox approach to dealing with environmental problems is taught in universities and practiced in government agencies and development banks, and the solutions are embedded in the mathematical formalism of general equilibrium theory. In this formalism, the point of convergence that allegedly legitimates the real or actual existence of the natural laws of economics is U, the symbol for the utility function, and the concrete effects of the operation of these laws allegedly manifest in decisions made by economic actors.

Because functional market economies must, in accordance with neoclassical economic theory, grow or expand, environmental economists presume that the health of these economies is sensitively dependent on the consumption of increasingly larger amounts of environmental resources. And because the theory is predicated on the assumption that a market system exists in a domain of reality separate and distinct from the natural environment, environmental economists assume that environmental resources outside of this domain are not subject to the pricing mechanisms that operate within the system. Like other mainstream economists, the environmental economists also assume that the natural laws of economics legislate over decisions made by economic actors, that pricing mechanisms are the indices of these decisions, and that the "real" value of environmental resources can only be determined by these mechanisms.

When environmental economists calculate the environmental costs of economic activities, these calculations are based on the assumption that the relative price of each bundle of an environmental good, service, or amenity reveals the "real marginal values" of the consumer. The creators of neoclassical economics conceived of the construct of marginal values after substituting utility for energy in the equations borrowed from mid-nineteenth century physics. In the resulting formalism, a marginal value essentially represents how much a consumer is willing to pay a little bit more of something to acquire a little bit more of something else. Note what the writers of our standard textbook on environmental economics have to say about the dynamics of this process:

"The power of a perfectly functioning market rests in its decentralized process of decision making and exchange; no omnipotent planner is needed to allocate resources. Rather, prices ration resources to those that value them the most and, in doing so, individuals are swept along by Adam Smith's invisible hand to achieve what is best for society as a collective. Optimal private decisions based on mutually advantageous exchange lead to optimal social outcomes." (Hanley N. *et al.* 1997).

In environmental economics, the presumption that optimal private decisions "based on mutually advantageous exchange"

lead to optimal social outcomes for the state of the environment is a primary article of faith. But according to these economists, this will not occur unless the following conditions apply—the market system in which economic actors make optimal private decisions must operate more or less perfectly, and the prices, or values, of environmental goods and services must be represented as a function of those decisions. But if these conditions are met, environmental economists assume that the lawful or law-like mechanisms of the market system will resolve environmental problems when the "prices are right."

The "right price" in neoclassical economic theory is a function of the prices that economic actors have paid, or are willing to pay, to realize some marginal benefits of environmental goods and services. This explains why much of the work of environmental economists is devoted to estimating the environmental costs of economic activities in these terms. This view of right prices also explains why the term "environmental externalities" has a rather peculiar meaning in the literature of mainstream economists. Externalities are situations in which the production or consumption of one economic actor affects another who did not pay for the good produced or consumed, and externalities are viewed as either negative or positive. For example, environmental economists often cite pollution as an example of the former and preservation of biological diversity as an example of the latter. When these economists use the phrase "environmental externalities," they are referring to environmental goods and services that are "external" to market systems in the sense that they are presumed to exist outside of the domain in which the allegedly lawful or law-like dynamics of these systems operate.

4. ENVIRONMENTAL POLICY AND MAINSTREAM ECONOMIC THEORY

Environmental economists often use cost benefit analyzes to place a value on environmental externalities, and the process of creating public policies to deal with environmental problems has been massively influenced by the results of these analyses. The problem that these accounting procedures are intended to resolve is that the only "real marginal values" the economists can confer on the environment are determined by the operation of the natural laws of economics within closed market systems. Given that the vast majority of the damage done to the natural environment by economic activities cannot be valued in these terms, environmental economists have developed indirect methods designed to estimate the "use-value" of these resources (Hanemann; 1994).

The process of developing these methods became a growth industry after Ronald Reagan issued Executive Order 12291 in 1981. The Order required that cost-benefit analyses be performed for all environmental regulations in the United States with annual costs in excess of $100 million and stipulated that regulations could be implemented only if the benefits to society exceed the costs. In theory, this concept seems fairly straightforward and very appealing. Why should we spend money dealing with an environmental problem if the costs exceed the benefits?

But when translated into the methods for evaluation used by environmental economists, "benefits to society" means the optimal social outcomes that result from the operation of the natural laws of economics within closed market systems. And the "costs" against which those benefits are measured refers to other manifestations of these non-existent laws—the amounts that economic actors are willing to pay to protect or preserve environmental goods, services and amenities, or the amounts they are willing to accept for the exploitation or consumption of those goods, services or amenities.

For example, the travel cost method is predicated on the assumption that the value a non-market resource, such as national parks and public forests, can be estimated based on the amount of money an economic actor would be willing to sacrifice to appreciate natural beauty. In this method, a statistical relationship between observed visits to non-market resources of natural beauty and the costs of visiting those resources is derived and used as a surrogate demand curve from which the consumer's surplus per visit-day can be measured. While the travel cost method of evaluation may seem rather esoteric and quite strange, it has been widely used in cost-benefit analyses of proposals in the U.S. and Britain to create or preserve publicly owned recreational areas (Fletcher *et al.* 1990).

Contingent valuation methods have been used to assess the economic value of recreation, scenic beauty, air quality, water quality, species preservation, bequests to future generations and other non-market environmental resources. The methods are intended to assess the willingness-to-pay function of economic actors who would prefer to preserve natural environments (preservation or existence values), maintain the option of using natural resources (option values), andbequeath natural resources to future generations (bequestvalues) (Sagoff, 1988). Most contingent valuation surveys seek to determine the maximal amount that individuals are willing to pay for an increase in the quality of an environmental resource and the minimal amount they are willing toaccept as compensation to forgot this increase.

For the sake of argument, let us assume that contingent valuations are capable of fully revealing maximal social outcomes of environmental policy decisions. Are we then to believe, as one such study showed (Mitchell and Carson 1986), that reduction in chemical contaminants in drinking water was not important in economic terms because the value of a statistical life associated with a reduction in risk of death in thirty years was only $181,000? Is $26 a measure of the real marginal costs of pollution because this is the average price that a household is willing to pay annually for a 10 percent improvement of visibility in eastern U.S. cities? (Tolley G. *et al.*, 1986). Is the value of Whooping Cranes the $22 per year average that one set of households was willing to pay to preserve this species (Bowker and Stoll 1985) and that of the Bald Eagle the $11 per year average that another set of households would spend to preserve this apparently less valuable species? (Boyle and Bishop 1987).

The assumption that market systems are separate and distinct from environmental systems is also apparent in the methods used by environmental ecologists to assess long-term economic impacts of changes in the global environment. For example, a well-known environmental economist notes in a study on the potential impact of global warming on the global economy that "climate change is likely to have different impacts on different sectors in different countries." He then says the following about the U.S. economy:

In reality, most of the U.S. economy has little interaction with climate. For example, cardiovascular surgery and parallel computing are undertaken in carefully controlled environments and are unlikely to be directly affected by climate change. More generally, underground mining, most services, communications, and manufacturing are sectors likely to be largely unaffected by climate change—sectors that comprise about 85 percent of GNP (Nordhaus, 1993).

The claim that sectors of an economy can be isolated from the impacts of global warming because they have little or no "interaction" with climate makes no sense at all. In the climate models environmental scientists use to study global warming, it is quite clear that increases in the 3 to 6 degree Centigrade range would have disastrous impacts on all natural environments, including those within the borders of the United States. Imagine that 80 percent of the corn crop in this country failed, that the waters flowing down Colorado River dropped in volume by 70 percent, that fisheries in most coastal waters collapsed, and one begins to get a sense of the scope of these potential impacts. Other market-based instruments that environmental economists use to posit economic solutions to environmental problems, such as subsidies, incentive structures, performance bonds and deposit refund schemes, are also premised on the assumption that the natural laws of economics actually exist and legislate over decisions made by economic actors.

5. MAINSTREAM ECONOMICS AND INTERNATIONAL TREATIES

Most of the commentary on the failure of the international community to effectively deal with the crisis in the global environment puts the blame on the usual suspects—the greed of international corporations, the inability of rich countries to empathize with the plight of poor countries, and the refusal of first world nations to accept any changes in the global balance of power. But the principal barrier to the resolution of this crisis is not the usual suspects. It is the failure to realize that unscientific assumptions in neoclassical economic theory effectively disallow the prospect of forging agreements that implement scientifically viable solutions.

The first step in this process is to negotiate a "general framework convention" that defines the environmental problem and the broad policy issues involved. If the negotiations do not break down at this stage, the framework convention could be implemented over time in a "regime." A regime is an evolving system that defines the problem in more specific terms, the action oriented "protocols" that could solve the problem, and the procedures and rules that should be followed. The agreements that survive this process have been hugely ineffectual. One reason why this is the case is the legal principle of state sovereignty allows governments to protect their economic interests at every stage of the negotiations. The other is that the interests governments seek to protect are based on the results of economic analyses done by the practitioners of neoclassical economic theory and there is no basis in this theory for implementing scientifically viable economic solutions.

The unfortunate result is that the Framework Convention on Climate Change (1992) failed to protect the climate system, the Convention on Biological Diversity (1992) did not even begun to reduce losses in biodiversity, and the Convention to Combat Desertification (1994) did not slow, much less reverse, this process. The Convention on the Law of the Sea (1982) and a host of other international agreements which were intended to reduce ocean pollution, to prevent over-fishing, and to protect endangered species failed to meet any of these objectives. Nonbinding principles that would promote more sustainable management of forests were agreed to at the Earth Summit (1992) but negotiations broke down prior to the point where a general framework convention could be articulated. A Convention on the Non-Navigable Uses of International Watercourses has been negotiated, but it has not gone into effect because some sovereign nation-states perceive this agreement as a threat to their economic interests (Speth, 2004).

Scientific evidence may play a supportive and enabling role in some negotiations, but only as a minimum condition for serious consideration of an environmental issue. For example, numerous scientific studies on the damage done to European forests by sulfur dioxide emissions led to an agreement in 1985 that reduced these emissions to 30 percent of 1980 levels. Similarly, the scientific evidence presented in the Second Assessment Report of the Intergovernmental Panel on Climate Change was partially responsible for the passage in 1997 of the Kyoto Protocol to the Framework Convention on Climate Change. But what is not widely known is that these agreements made a mockery of the scientifically based solutions. In the vast majority of negotiations on a great range of issues, such as commercial whaling, hazardous waste trade, loss of biodiversity, conditions in the Antarctic, and ocean dumping of radioactive waste, the scientific evidence was not given serious consideration. When this evidence was perceived as a direct threat to the perceived vested interests of particular nation-states, it was either systematically ignored or explicitly rejected by the representatives of these states (Porter *et al.*, 2000: pp1-34).

6. THE TWO CULTURE PROBLEM

In my view, the greatest obstacle to implementing scientifically viable economic solutions for environmental problems is not the

claim that neoclassical economic theory is scientific. It is the two culture problem famously described by British physicist and novelist C. P. Snow in a lecture given at Oxford University in 1959 (Snow, 1993). Snow was concerned that the single intellectual culture that existed prior to World War II was splitting into two cultures with social scientists on one side of the two-culture divide and scientists on the other. As it turned out, the two-culture problem was not resolved, the members of the two cultures became increasingly isolated from each other, and the two-culture divide eventually became a yawning chasm.

The failure to resolve the two-culture problem explains why the members of the cultures of mainstream economists and environmental scientists have virtually no contact with one another and perform completely different roles and functions during every stage in the process of developing solutions for environmental problems. It also explains why the language used by members of one culture is virtually incomprehensible to the members of the other and why the cultural differences are very large. These differences range from alternate worldviews and methodologies to disparate rules for gathering evidence and making predictions based on this evidence.

The most expedient way to resolve this two-culture problem is also the most efficient way to develop scientifically viable economic solutions for environmental problems. The solution is to create institutional frameworks and processes that require mainstream economists and environmental scientists to work closely together during every stage in the process of developing these solutions. But this vital enterprise will not be successful unless the scientists and the economists who participate in this process are willing to violate the unwritten rule that members of one culture must not challenge the knowledge claims of those on other side of the two culture divide.

The economists will not appreciate being told that the economic theory they have used throughout their careers to build their professional reputations and earn a living is predicated on unscientific axiomatic assumptions. And the scientists will not appreciate being told that the benefits of protecting environmental resources must be evaluated in terms of the economic losses that could be suffered by people who depend on these resources for their livelihood. But this dialogue could be very beneficial and quite productive if the members of both cultures realize that the objective is not to win an intellectual debate or defeat an intellectual foe. It is achieve the level of mutual cooperation and understanding required to realize a once in all human lifetimes opportunity. The opportunity is to protect the lives of the 6.9 billion members of the extended human family and the future existence of subsequent generations of this family by developing and implementing scientifically viable solutions for environmental problems.

Barak Obama repeatedly said during the presidential campaign that his administration would do all that is required to effectively deal with the problem of global warming. If President Obama intends to keep this promise, there are three initiatives that should be at the top of his political and legislative agenda. The first is to create a federally sponsored agency in which mainstream economists and environmental scientists are obliged to work closely together to develop scientifically viable economic policies and programs that reduce worldwide emissions of carbon dioxide to levels where large scale irreversible changes in the climate system will not occur. The second is to develop a proposal for implementing these policies and programs in a post Kyoto agreement that privileges the well being of all of humanity over the narrowly defined and short sighted economic interests of the United States and other economically prosperous countries. And the third is to use all the diplomatic and other resources required to ensure that this proposal is implemented during the final phase of forging the terms of this agreement. If this initiative is successful, Barak Obama will be remembered not merely as a great American president but also as one of the most humane and enlightened political leaders in the annals of human history.

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