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## Do We Consume Too Much?

*Discussions of the future of the planet are dominated by those who believe that an expanding world economy will use up natural resources and those who see no reasons, environmental or otherwise, to limit economic growth. Neither side has it right*

by Mark Sagoff

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**I**N 1994, when delegates from around the world gathered in Cairo for the International Conference on Population and Development, representatives from developing countries protested that a baby born in the United States will consume during its lifetime twenty times as much of the world's resources as an African or an Indian baby. The problem for the world's environment, they argued, is overconsumption in the North, not overpopulation in the South.

Consumption in industrialized nations "has led to overexploitation of the resources of developing countries," a speaker from Kenya declared. A delegate from Antigua

reproached the wealthiest 20 percent of the world's population for consuming 80 percent of the goods and services produced from the earth's resources.

Do we consume too much? To some, the answer is self-evident. If there is only so much food, timber, petroleum, and other material to go around, the more we consume, the less must be available for others. The global economy cannot grow indefinitely on a finite planet. As populations increase and economies expand, natural resources must be depleted; prices will rise, and humanity -- especially the poor and future generations at all income levels -- will suffer as a result.

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Other reasons to suppose we consume too much are less often stated though also widely believed. Of these the simplest -- a lesson we learn from our parents and from literature since the Old Testament -- may be the best: although we must satisfy basic needs, a good life is not one devoted to amassing material possessions; what we own comes to own us, keeping us from fulfilling commitments that give meaning to life, such as those to family, friends, and faith. The appreciation of nature also deepens our lives. As we consume more, however, we are more likely to transform the natural world, so that less of it will remain for us to appreciate.

The reasons for protecting nature are often religious or moral. As the philosopher Ronald Dworkin points out, many

Americans believe that we have an obligation to protect species which goes beyond our own well-being; we "think we should admire and protect them because they are important in themselves, and not just if or because we or others want or enjoy them." In a recent survey Americans from various walks of life agreed by large majorities with the statement "Because God created the natural world, it is wrong to abuse it." The anthropologists who conducted this survey concluded that "divine creation is the closest concept American culture provides to express the sacredness of nature."

During the nineteenth century preservationists forthrightly gave ethical and spiritual reasons for protecting the natural world. John Muir condemned the "temple destroyers, devotees of ravaging commercialism" who "instead of lifting their eyes to the God of the mountains, lift them to the Almighty dollar." This was not a call for better cost-benefit analysis: Muir described nature not as a commodity but as a companion. Nature is sacred, Muir held, whether or not resources are scarce.

Philosophers such as Emerson and Thoreau thought of nature as full of divinity. Walt Whitman celebrated a leaf of grass as no less than the journeywork of the stars: "After you have exhausted what there is in business, politics, conviviality, love, and so on," he wrote in *Specimen Days*, and "found that none of these finally satisfy, or

permanently wear -- what remains? Nature remains." These philosophers thought of nature as a refuge from economic activity, not as a resource for it.

Today those who wish to protect the natural environment rarely offer ethical or spiritual reasons for the policies they favor. Instead they say we are running out of resources or causing the collapse of ecosystems on which we depend. Predictions of resource scarcity appear objective and scientific, whereas pronouncements that nature is sacred or that greed is bad appear judgmental or even embarrassing in a secular society. Prudential and economic arguments, moreover, have succeeded better than moral or spiritual ones in swaying public policy.

These prudential and economic arguments are not likely to succeed much longer. It is simply wrong to believe that nature sets physical limits to economic growth -- that is, to prosperity and the production and consumption of goods and services on which it is based. The idea that increasing consumption will inevitably lead to depletion and scarcity, as plausible as it may seem, is mistaken both in principle and in fact. It is based on four misconceptions.

### **Misconception No. 1: We Are Running Out of Raw Materials**

**I**N the 1970s Paul Ehrlich, a biologist at Stanford University, predicted that global shortages would soon send prices for

food, fresh water, energy, metals, paper, and other materials sharply higher. "It seems certain," Paul and Anne Ehrlich wrote in *The End of Affluence* (1974), "that energy shortages will be with us for the rest of the century, and that before 1985 mankind will enter a genuine age of scarcity in which many things besides energy will be in short supply." Crucial materials would near depletion during the 1980s, Ehrlich predicted, pushing prices out of reach. "Starvation among people will be accompanied by starvation of industries for the materials they require."

Things have not turned out as Ehrlich expected. In the early 1990s real prices for food overall fell. Raw materials -- including energy resources -- are generally more abundant and less expensive today than they were twenty years ago. When Ehrlich wrote, economically recoverable world reserves of petroleum stood at 640 billion barrels. Since that time reserves have *increased* by more than 50 percent, reaching more than 1,000 billion barrels in 1989. They have held steady in spite of rising consumption. The pre-tax real price of gasoline was lower during this decade than at any other time since 1947. The World Energy Council announced in 1992 that "fears of imminent [resource] exhaustion that were widely held 20 years ago are now considered to have been unfounded."

The World Resources Institute, in a 1994-1995 report, referred to "the frequently

expressed concern that high levels of consumption will lead to resource depletion and to physical shortages that might limit growth or development opportunity." Examining the evidence, however, the institute said that "the world is not yet running out of most nonrenewable resources and is not likely to, at least in the next few decades." A 1988 report from the Office of Technology Assessment concluded, "The nation's future has probably never been less constrained by the cost of natural resources."

It is reasonable to expect that as raw materials become less expensive, they will be more rapidly depleted. This expectation is also mistaken. From 1980 to 1990, for example, while the prices of resource-based commodities declined (the price of rubber by 40 percent, cement by 40 percent, and coal by almost 50 percent), reserves of most raw materials increased. Economists offer three explanations.

First, with regard to subsoil resources, the world becomes ever more adept at discovering new reserves and exploiting old ones. Exploring for oil, for example, used to be a hit-or-miss proposition, resulting in a lot of dry holes. Today oil companies can use seismic waves to help them create precise computer images of the earth. New methods of extraction -- for example, using bacteria to leach metals from low-grade ores -- greatly increase resource recovery. Reserves of resources "are actually

functions of technology," one analyst has written. "The more advanced the technology, the more reserves become known and recoverable."

Second, plentiful resources can be used in place of those that become scarce. Analysts speak of an Age of Substitutability and point, for example, to nanotubes, tiny cylinders of carbon whose molecular structure forms fibers a hundred times as strong as steel, at one sixth the weight. As technologies that use more-abundant resources substitute for those needing less-abundant ones -- for example, ceramics in place of tungsten, fiber optics in place of copper wire, aluminum cans in place of tin ones -- the demand for and the price of the less-abundant resources decline.

One can easily find earlier instances of substitution. During the early nineteenth century whale oil was the preferred fuel for household illumination. A dwindling supply prompted innovations in the lighting industry, including the invention of gas and kerosene lamps and Edison's carbon-filament electric bulb. Whale oil has substitutes, such as electricity and petroleum-based lubricants. Whales are irreplaceable.

Third, the more we learn about materials, the more efficiently we use them. The progress from candles to carbon-filament to tungsten incandescent lamps, for example, decreased the energy required for and the cost of a unit of household lighting by many

times. Compact fluorescent lights are four times as efficient as today's incandescent bulbs and last ten to twenty times as long. Comparable energy savings are available in other appliances: for example, refrigerators sold in 1993 were 23 percent more efficient than those sold in 1990 and 65 percent more efficient than those sold in 1980, saving consumers billions in electric bills.

Amory Lovins, the director of the Rocky Mountain Institute, has described in these pages a new generation of ultralight automobiles that could deliver the safety and muscle of today's cars but with far better mileage -- four times as much in prototypes and ten times as much in projected models (see "Reinventing the Wheels," January, 1995, *Atlantic*). Since in today's cars only 15 to 20 percent of the fuel's energy reaches the wheels (the rest is lost in the engine and the transmission), and since materials lighter and stronger than steel are available or on the way, no expert questions the feasibility of the high-mileage vehicles Lovins describes.

Computers and cameras are examples of consumer goods getting lighter and smaller as they get better. The game-maker Sega is marketing a hand-held children's game, called Saturn, that has more computing power than the 1976 Cray supercomputer, which the United States tried to keep out of the hands of the Soviets. Improvements that extend the useful life of objects also save resources. Platinum spark plugs in today's



cars last for 100,000 miles, as do "fill-for-life" transmission fluids. On average, cars bought in 1993 have a useful life more than 40 percent longer than those bought in 1970.

As lighter materials replace heavier ones, the U.S. economy continues to shed weight. Our per capita consumption of raw materials such as forestry products and metals has, measured by weight, declined steadily over the past twenty years. A recent World Resources Institute study measured the "materials intensity" of our economy -- that is, "the total material input and the hidden or indirect material flows, including deliberate landscape alterations" required for each dollar's worth of economic output. "The result shows a clearly declining pattern of materials intensity, supporting the conclusion that economic activity is growing somewhat more rapidly than natural resource use." Of course, we should do better. The Organization for Economic Cooperation and Development, an association of the world's industrialized nations, has proposed that its members strive as a long-range goal to decrease their materials intensity by a factor of ten.

Communications also illustrates the trend toward lighter, smaller, less materials-intensive technology. Just as telegraph cables replaced frigates in transmitting messages across the Atlantic and carried more information faster, glass fibers and microwaves have replaced cables -- each

new technology using less materials but providing greater capacity for sending and receiving information. Areas not yet wired for telephones (in the former Soviet Union, for example) are expected to leapfrog directly into cellular communications. Robert Solow, a Nobel laureate in economics, says that if the future is like the past, "there will be prolonged and substantial reductions in natural-resource requirements per unit of real output." He asks, "Why shouldn't the productivity of most natural resources rise more or less steadily through time, like the productivity of labor?"

### **Misconception No. 2: We Are Running Out of Food and Timber**

**T**HE United Nations projects that the global population, currently 5.7 billion, will peak at about 10 billion in the next century and then stabilize or even decline. Can the earth feed that many people? Even if food crops increase sufficiently, other renewable resources, including many fisheries and forests, are already under pressure. Should we expect fish stocks to collapse or forests to disappear?

The world already produces enough cereals and oilseeds to feed 10 billion people a vegetarian diet adequate in protein and calories. If, however, the idea is to feed 10 billion people not healthful vegetarian diets but the kind of meat-laden meals that

Americans eat, the production of grains and oilseeds may have to triple -- primarily to feed livestock. Is anything like this kind of productivity in the cards?

Maybe. From 1961 to 1994 global production of food doubled. Global output of grain rose from about 630 million tons in 1950 to about 1.8 billion tons in 1992, largely as a result of greater yields.

Developing countries from 1974 to 1994 increased wheat yields per acre by almost 100 percent, corn yields by 72 percent, and rice yields by 52 percent. "The generation of farmers on the land in 1950 was the first in history to double the production of food," the Worldwatch Institute has reported. "By 1984, they had outstripped population growth enough to raise per capita grain output an unprecedented 40 percent."

>From a two-year period ending in 1981 to a two-year period ending in 1990 the real prices of basic foods fell 38 percent on world markets, according to a 1992 United Nations report. Prices for food have continually decreased since the end of the eighteenth century, when Thomas Malthus argued that rapid population growth must lead to mass starvation by exceeding the carrying capacity of the earth.

Farmers worldwide could double the acreage in production, but this should not be necessary. Better seeds, more irrigation, multi-cropping, and additional use of fertilizer could greatly increase agricultural yields in the developing world, which are

now generally only half those in the industrialized countries. It is biologically possible to raise yields of rice to about seven tons per acre -- about four times the current average in the developing world. Super strains of cassava, a potato-like root crop eaten by millions of Africans, promise to increase yields tenfold. American farmers can also do better. In a good year, such as 1994, Iowa corn growers average about 3.5 tons per acre, but farmers more than double that yield in National Corn Growers Association competitions.

In drier parts of the world the scarcity of fresh water presents the greatest challenge to agriculture. But the problem is regional, not global. Fortunately, as Lester Brown, of the Worldwatch Institute, points out, "there are vast opportunities for increasing water efficiency" in arid regions, ranging from installing better water-delivery systems to planting drought-resistant crops. He adds, "Scientists can help push back the physical frontiers of cropping by developing varieties that are more drought resistant, salt tolerant, and early maturing. The payoff on the first two could be particularly high."

As if in response, Novartis Seeds has announced a program to develop water-efficient and salt-tolerant crops, including genetically engineered varieties of wheat. Researchers in Mexico have announced the development of drought-resistant corn that can boost yields by a third. Biotechnologists are converting annual crops into perennial

ones, eliminating the need for yearly planting. They also hope to enable cereal crops to fix their own nitrogen, as legumes do, minimizing the need for fertilizer (genetically engineered nitrogen-fixing bacteria have already been test-marketed to farmers). Commercial varieties of crops such as corn, tomatoes, and potatoes which have been genetically engineered to be resistant to pests and diseases have been approved for field testing in the United States; several are now being sold and planted. A new breed of rice, 25 percent more productive than any currently in use, suggests that the Gene Revolution can take over where the Green Revolution left off. Biotechnology, as the historian Paul Kennedy has written, introduces "an entirely new stage in humankind's attempts to produce more crops and plants."

Biotechnology cannot, however, address the major causes of famine: poverty, trade barriers, corruption, mismanagement, ethnic antagonism, anarchy, war, and male-dominated societies that deprive women of food. Local land depletion, itself a consequence of poverty and institutional failure, is also a factor. Those who are too poor to use sound farming practices are compelled to overexploit the resources on which they depend. As the economist Partha Dasgupta has written, "Population growth, poverty and degradation of local resources often fuel one another." The amount of food in world trade is constrained less by the resource base than by the maldistribution of

wealth.

Analysts who believe that the world is running out of resources often argue that famines occur not as a result of political or economic conditions but because there are "too many people." Unfortunately, as the economist Amartya Sen has pointed out, public officials who think in Malthusian terms assume that when absolute levels of food supplies are adequate, famine will not occur. This conviction diverts attention from the actual causes of famine, which has occurred in places where food output kept pace with population growth but people were too destitute to buy it.

We would have run out of food long ago had we tried to supply ourselves entirely by hunting and gathering. Likewise, if we depend on nature's gifts, we will exhaust many of the world's important fisheries. Fortunately, we are learning to cultivate fish as we do other crops. Genetic engineers have designed fish for better flavor and color as well as for faster growth, improved disease resistance, and other traits. Two farmed species -- silver carp and grass carp -- already rank among the ten most-consumed fish worldwide. A specially bred tilapia, known as the "aquatic chicken," takes six months to grow to a harvestable size of about one and a half pounds.

Aquaculture produced more than 16 million tons of fish in 1993; capacity has expanded over the past decade at an annual rate of 10 percent by quantity and 14 percent by value.

In 1993 fish farms produced 22 percent of all food fish consumed in the world and 90 percent of all oysters sold. The World Bank reports that aquaculture could provide 40 percent of all fish consumed and more than half the value of fish harvested within the next fifteen years.

Salmon ranching and farming provide examples of the growing efficiency of aquacultural production. Norwegian salmon farms alone produce 400 million pounds a year. A biotech firm in Waltham, Massachusetts, has applied for government approval to commercialize salmon genetically engineered to grow four to six times as fast as their naturally occurring cousins. As a 1994 article in *Sierra* magazine noted, "There is so much salmon currently available that the supply exceeds demand, and prices to fishermen have fallen dramatically."

For those who lament the decline of natural fisheries and the human communities that grew up with them, the successes of aquaculture may offer no consolation. In the Pacific Northwest, for example, overfishing in combination with dams and habitat destruction has reduced the wild salmon population by 80 percent. Wild salmon -- but not their bio-engineered aquacultural cousins -- contribute to the cultural identity and sense of place of the Northwest. When wild salmon disappear, so will some of the region's history, character, and pride. What is true of wild salmon is also true of whales,

dolphins, and other magnificent creatures -- as they lose their economic importance, their aesthetic and moral worth becomes all the more evident. Economic considerations pull in one direction, moral considerations in the other. This conflict colors all our battles over the environment.

**From the archive:**

- **"An Explosion of Green," by Bill McKibben (April, 1995)**

"The reforestation of the eastern United States -- thanks partly to conservationists and mostly to accident -- can show the developing world how to make room for people, farming, industry, and endangered species of plants and animals, which have been returning. We can give the rest of the world a better example if we address the problems that even this fortunate region

The transition from hunting and gathering to farming, which is changing the fishing industry, has taken place more slowly in forestry. Still there is no sign of a timber famine. In the United States forests now provide the largest harvests in history, and there is more forested U.S. area today than there was in 1920. Bill McKibben has observed in these pages that the eastern United States, which loggers and farmers in the eighteenth and nineteenth centuries nearly denuded of trees, has become reforested during this century (see "An Explosion of Green," April, 1995, *Atlantic*). One reason is that farms reverted to woods. Another is that machinery replaced animals; each draft animal required two or three cleared acres for pasture.

Natural reforestation is likely to continue as biotechnology makes areas used for logging more productive. According to Roger Sedjo, a respected forestry expert, advances in tree farming, if implemented widely, would permit the world to meet its entire demand for industrial wood using just 200 million acres of plantations -- an area equal to only five percent of current forest land. As less land is required for commercial tree production, more natural forests may be



still faces. "

protected -- as they should be, for aesthetic, ethical, and spiritual reasons.

Often natural resources are so plentiful and therefore inexpensive that they undercut the necessary transition to technological alternatives. If the U.S. government did not protect wild forests from commercial exploitation, the timber industry would have little incentive to invest in tree plantations, where it can multiply yields by a factor of ten and take advantage of the results of genetic research. Only by investing in plantation silviculture can North American forestry fend off price competition from rapidly developing tree plantations in the Southern Hemisphere. Biotechnology-based silviculture can in the near future be expected to underprice "extractive" forestry worldwide. In this decade China will plant about 150 million acres of trees; India now plants four times the area it harvests commercially.

**From the archive:**

• **"The Age of Social Transformation,"**  
by Peter Drucker  
(November, 1994)

"A survey of the epoch that began early in this century, and an analysis of its latest

The expansion of fish and tree farming confirms the belief held by Peter Drucker and other management experts that our economy depends far more on the progress of technology than on the exploitation of nature. Although raw materials will always be necessary, knowledge has become the essential factor in the production of goods and services. "Where there is effective management," Drucker has written, "that is, application of knowledge to knowledge, we can always obtain the other resources." If we assume, along with Drucker and others, that resource scarcities do not exist or are

manifestations: an economic order in which knowledge, not labor or raw material or capital, is the key resource; a social order in which inequality based on knowledge is a major challenge; and a polity in which government cannot be looked to for solving social and economic problems ."

easily averted, it is hard to see how economic theory, which after all concerns scarcity, provides the conceptual basis for valuing the environment. The reasons to preserve nature are ethical more often than they are economic.

### **Misconception No. 3: We Are Running Out of Energy**

**P**ROBABLY the most persistent worries about resource scarcity concern energy. "The supply of fuels and other natural resources is becoming the limiting factor constraining the rate of economic growth," a group of experts proclaimed in 1986. They predicted the exhaustion of domestic oil and gas supplies by 2020 and, within a few decades, "major energy shortages as well as food shortages in the world."

Contrary to these expectations, no global shortages of hydrocarbon fuels are in sight. "One sees no immediate danger of 'running out' of energy in a global sense," writes John P. Holdren, a professor of environmental policy at Harvard University. According to Holdren, reserves of oil and natural gas will last seventy to a hundred years if exploited at 1990 rates. (This does not take into account huge deposits of oil shale, heavy oils, and gas from unconventional sources.) He concludes that "running out of energy resources in any global sense is not what the energy problem is all about."

The global energy problem has less to do with depleting resources than with controlling pollutants. Scientists generally agree that gases, principally carbon dioxide, emitted in the combustion of hydrocarbon fuels can build up in and warm the atmosphere by trapping sunlight. Since carbon dioxide enhances photosynthetic activity, plants to some extent absorb the carbon dioxide we produce. In 1995 researchers reported in *Science* that vegetation in the Northern Hemisphere in 1992 and 1993 converted into trees and other plant tissue 3.5 billion tons of carbon - - more than half the carbon produced by the burning of hydrocarbon fuels worldwide.

However successful this and other feedback mechanisms may be in slowing the processes of global warming, a broad scientific consensus, reflected in a 1992 international treaty, has emerged for stabilizing and then decreasing emissions of carbon dioxide and other "greenhouse" gases. This goal is well within the technological reach of the United States and other industrialized countries. Amory Lovins, among others, has described commercially available technologies that can "support present or greatly expanded worldwide economic activity while stabilizing global climate -- and saving money." He observes that "even very large expansions in population and industrial activity need not be energy-constrained."

Lovins and other environmentalists contend

that pollution-free energy from largely untapped sources is available in amounts exceeding our needs. Geothermal energy -- which makes use of heat from the earth's core -- is theoretically accessible through drilling technology in the United States in amounts thousands of times as great as the amount of energy contained in domestic coal reserves. Tidal energy is also promising. Analysts who study solar power generally agree with Lester Brown, of the [Worldwatch Institute](#), that "technologies are ready to begin building a world energy system largely powered by solar resources." In the future these and other renewable energy sources may be harnessed to the nation's system of storing and delivering electricity.

**From the archive:**

- **["Mideast Oil Forever?,"](#) by Joseph J. Romm and Charles B. Curtis (April, 1996)**

"Congressional budget-cutters threaten to end America's leadership in new energy technologies that could generate hundreds of thousands of high-wage jobs,

Last year Joseph Romm and Charles Curtis described in these pages advances in photovoltaic cells (which convert sunlight into electricity), fuel cells (which convert the hydrogen in fuels directly to electricity and heat, producing virtually no pollution), and wind power ("Mideast Oil Forever?" April, 1996, *Atlantic*). According to these authors, genetically engineered organisms used to ferment organic matter could, with further research and development, bring down the costs of ethanol and other environmentally friendly "biofuels" to make them competitive with gasoline.

Environmentalists who, like Amory Lovins, believe that our economy can grow and still reduce greenhouse gases emphasize not only that we should be able to move to

reduce damage to the environment, and limit our costly, dangerous dependency on oil from the unstable Persian Gulf Region ."

renewable forms of energy but also that we can use fossil fuels more efficiently. Some improvements are already evident. In developed countries the energy intensity of production -- the amount of fuel burned per dollar of economic output -- has been decreasing by about two percent a year.

From 1973 to 1986, for example, energy consumption in the United States remained virtually flat while economic production grew by almost 40 percent. Compared with Germany or Japan, this is a poor showing. The Japanese, who tax fuel more heavily than we do, use only half as much energy as the United States per unit of economic output. (Japanese environmental regulations are also generally stricter than ours; if anything, this has improved the competitiveness of Japanese industry.) The United States still wastes hundreds of billions of dollars annually in energy inefficiency. By becoming as energy-efficient as Japan, the United States could expand its economy and become more competitive internationally.

If so many opportunities exist for saving energy and curtailing pollution, why have we not seized them? One reason is that low fossil-fuel prices remove incentives for fuel efficiency and for converting to other energy sources. Another reason is that government subsidies for fossil fuels and nuclear energy amounted to many billions of dollars a year during the 1980s, whereas support for renewables dwindled to \$114

million in 1989, a time when it had been proposed for near elimination. "Lemon socialism," a vast array of subsidies and barriers to trade, protects politically favored technologies, however inefficient, dangerous, filthy, or obsolete. "At heart, the major obstacles standing in the way [of a renewable-energy economy] are not technical in nature," the energy consultant Michael Brower has written, "but concern the laws, regulations, incentives, public attitudes, and other factors that make up the energy market."

In response to problems of climate change, the World Bank and other international organizations have recognized the importance of transferring advanced energy technologies to the developing world. Plainly, this will take a large investment of capital, particularly in education. Yet the "alternative for developing countries," according to José Goldemberg, a former Environment Minister of Brazil, "would be to remain at a dismally low level of development which . . . would aggravate the problems of sustainability."

Technology transfer can hasten sound economic development worldwide. Many environmentalists, however, argue that economies cannot expand without exceeding the physical limits nature sets -- for example, with respect to energy. These environmentalists, who regard increasing affluence as a principal cause of environmental degradation, call for

economic retrenchment and retraction -- a small economy for a small earth. With Paul Ehrlich, they reject "the hope that development can greatly increase the size of the economic pie and pull many more people out of poverty." This hope is "basically a humane idea," Ehrlich has written, "made insane by the constraints nature places on human activity."

In developing countries, however, a no-growth economy "will deprive entire populations of access to better living conditions and lead to even more deforestation and land degradation," as Goldemberg warns. Moreover, citizens of developed countries are likely to resist an energy policy that they associate with poverty, discomfort, sacrifice, and pain. Technological pessimism, then, may not be the best option for environmentalists. It is certainly not the only one.

### **Misconception No. 4: The North Exploits the South**

**W**ILLIAM Reilly, when he served as administrator of the Environmental Protection Agency in the Bush Administration, encountered a persistent criticism at international meetings on the environment. "The problem for the world's environment is your consumption, not our population," delegates from the developing world told him. Some of these delegates later took Reilly aside. "The North buys too little from the South," they confided. "The

real problem is too little demand for our exports."

The delegates who told Reilly that the North consumes too little of what the South produces have a point. "With a few exceptions (notably petroleum)," a report from the World Resources Institute observes, "most of the natural resources consumed in the United States are from domestic sources." Throughout the 1980s the United States and Canada were the world's leading exporters of raw materials. The United States consistently leads the world in farm exports, running huge agricultural trade surpluses. The share of raw materials used in the North that it buys from the South stands at a thirty-year low and continues to decline; industrialized nations trade largely among themselves. The World Resources Institute recently reported that "the United States is largely self-sufficient in natural resources." Again, excepting petroleum, bauxite (from which aluminum is made), "and a few other industrial minerals, its material flows are almost entirely internal."

Sugar provides an instructive example of how the North excludes -- rather than exploits -- the resources of the South. Since 1796 the United States has protected domestic sugar against imports. American sugar growers, in part as a reward for large contributions to political campaigns, have long enjoyed a system of quotas and prohibitive tariffs against foreign



competition. American consumers paid about three times world prices for sugar in the 1980s, enriching a small cartel of U.S. growers. *Forbes* magazine has estimated that a single family, the Fanjuls, of Palm Beach, reaps more than \$65 million a year as a result of quotas for sugar.

The sugar industry in Florida, which is larger than that in any other state, makes even less sense environmentally than economically. It depends on a publicly built system of canals, levees, and pumping stations. Fertilizer from the sugarcane fields chokes the Everglades. Sugar growers, under a special exemption from labor laws, import Caribbean laborers to do the grueling and poorly paid work of cutting cane.

As the United States tightened sugar quotas (imports fell from 6.2 to 1.5 million tons annually from 1977 to 1987), the Dominican Republic and other nations with climates ideal for growing cane experienced political turmoil and economic collapse. Many farmers in Latin America, however, did well by switching from sugar to coca, which is processed into cocaine -- perhaps the only high-value imported crop for which the United States is not developing a domestic substitute.

Before the Second World War the United States bought 40 percent of its vegetable oils from developing countries. After the war the United States protected its oilseed markets -- for example, by establishing

price supports for soybeans. Today the United States is one of the world's leading exporters of oil and oilseeds, although it still imports palm and coconut oils to obtain laurate, an ingredient in soap, shampoo, and detergents. Even this form of "exploitation" will soon cease. In 1994 farmers in Georgia planted the first commercial acreage of a high-laurate canola, genetically engineered by Calgene, a biotechnology firm.

About 100,000 Kenyans make a living on small plots of land growing pyrethrum flowers, the source of a comparatively environmentally safe insecticide of which the United States has been the largest importer. The U.S. Department of Commerce, however, awarded \$1.2 million to a biotechnology firm to engineer pyrethrum genetically. Industrial countries will soon be able to synthesize all the pyrethrum they need and undersell Kenyan farmers.

An article in *Foreign Policy* in December of 1995 observed that the biotechnological innovations that create "substitutes for everything from vanilla to cocoa and coffee threaten to eliminate the livelihood of millions of Third World agricultural workers." Vanilla cultured in laboratories costs a fifth as much as vanilla extracted from beans, and thus jeopardizes the livelihood of tens of thousands of vanilla farmers in Madagascar. In the past, farms produced agricultural commodities and factories processed them. In the future,

factories may "grow" as well as process many of the most valuable commodities -- or the two functions will become one. As one plant scientist has said, "We have to stop thinking of these things as plant cells, and start thinking of them as new microorganisms, with all the potential that implies" -- meaning, for instance, that the cells could be made to grow in commercially feasible quantities in laboratories, not fields.

The North not only balks at buying sugar and other crops from developing countries; it also dumps its excess agricultural commodities, especially grain, on them. After the Second World War, American farmers, using price supports left over from the New Deal, produced vast wheat surpluses, which the United States exported at concessionary prices to Europe and then the Third World. These enormous transfers of cereals to the South, institutionalized during the 1950s and 1960s by U.S. food aid, continued during the 1970s and 1980s, as the United States and the European Community vied for markets, each outdoing the other in subsidizing agricultural exports.

Grain imports from the United States "created food dependence within two decades in countries which had been mostly self-sufficient in food at the end of World War II," the sociologist Harriet Friedmann has written. Tropical countries soon matched the grain gluts of the North with their own surpluses of cocoa, coffee, tea,

bananas, and other export commodities. Accordingly, prices for these commodities collapsed as early as 1970, catching developing nations in a scissors. As Friedmann describes it, "One blade was food import dependency. The other blade was declining revenues for traditional exports of tropical crops."

It might be better for the environment if the North exchanged the crops for which it is ecologically suited -- wheat, for example -- for crops easily grown in the South, such as coffee, cocoa, palm oil, and tea. Contrary to common belief, these tropical export crops - - which grow on trees and bushes, providing canopy and continuous root structures to protect the soil -- are less damaging to the soil than are traditional staples such as cereals and root crops. Better markets for tropical crops could help developing nations to employ their rural populations and to protect their natural resources. Allen Hammond, of the World Resources Institute, points out that "if poor nations cannot export anything else, they will export their misery -- in the form of drugs, diseases, terrorism, migration, and environmental degradation."

Peasants in less-developed nations often confront intractable poverty, an entrenched land-tenure system, and a lack of infrastructure; they have little access to markets, education, or employment. Many of the rural poor, according to the environmental consultant Norman Myers,

"have no option but to over-exploit environmental resource stocks in order to survive" -- for example, by "increasingly encroaching onto tropical forests among other low-potential lands." These poorest of the poor "are causing as much natural-resource depletion as the other three billion developing-world people put together."

Myers observes that traditional indigenous farmers in tropical forests moved from place to place without seriously damaging the ecosystem. The principal agents of tropical deforestation are refugees from civil war and rural poverty, who are forced to eke out a living on marginal lands. Activities such as road building, logging, and commercial agriculture have barely increased in tropical forests since the early 1980s, according to Myers; slash-and-burn farming by displaced peasants accounts for far more deforestation -- roughly three fifths of the total. Its impact is fast expanding. Most of the wood from trees harvested in tropical forests -- that is, those not cleared for farms -- is used locally for fuel. The likeliest path to protecting the rain forest is through economic development that enables peasants to farm efficiently, on land better suited to farming than to forest.

Many have argued that economic activity, affluence, and growth automatically lead to resource depletion, environmental deterioration, and ecological collapse. Yet greater productivity and prosperity -- which is what economists mean by growth -- have

become prerequisite for controlling urban pollution and protecting sensitive ecological systems such as rain forests. Otherwise, destitute people who are unable to acquire food and fuel will create pollution and destroy forests. Without economic growth, which also correlates with lower fertility, the environmental and population problems of the South will only get worse. For impoverished countries facing environmental disaster, economic growth may be the one thing that is sustainable.

### **What Is Wrong With Consumption?**

**M**ANY of us who attended college in the 1960s and 1970s took pride in how little we owned. We celebrated our freedom when we could fit all our possessions -- mostly a stereo -- into the back of a Beetle. Decades later, middle-aged and middle-class, many of us have accumulated an appalling amount of stuff. Piled high with gas grills, lawn mowers, excess furniture, bicycles, children's toys, garden implements, lumber, cinder blocks, ladders, lawn and leaf bags stuffed with memorabilia, and boxes yet to be unpacked from the last move, the two-car garages beside our suburban homes are too full to accommodate the family minivan. The quantity of resources, particularly energy, we waste and the quantity of trash we throw away (recycling somewhat eases our conscience) add to our consternation.

Even if predictions of resource depletion and ecological collapse are mistaken, it seems that they *should* be true, to punish us for our sins. We are distressed by the suffering of others, the erosion of the ties of community, family, and friendship, and the loss of the beauty and spontaneity of the natural world. These concerns reflect the most traditional and fundamental of American religious and cultural values.

Simple compassion instructs us to give to relieve the misery of others. There is a lot of misery worldwide to relieve. But as bad as the situation is, it is improving. In 1960 nearly 70 percent of the people in the world lived at or below the subsistence level. Today less than a third do, and the number enjoying fairly satisfactory conditions (as measured by the United Nations Human Development Index) rose from 25 percent in 1960 to 60 percent in 1992. Over the twenty-five years before 1992 average per capita consumption in developing countries increased 75 percent in real terms. The pace of improvements is also increasing. In developing countries in that period, for example, power generation and the number of telephone lines per capita doubled, while the number of households with access to clean water grew by half.

What is worsening is the discrepancy in income between the wealthy and the poor. Although world income measured in real terms has increased by 700 percent since the Second World War, the wealthiest people

have absorbed most of the gains. Since 1960 the richest fifth of the world's people have seen their share of the world's income increase from 70 to 85 percent. Thus one fifth of the world's population possesses much more than four fifths of the world's wealth, while the share held by all others has correspondingly fallen; that of the world's poorest 20 percent has declined from 2.3 to 1.4 percent.

**From the archive:**

• **"Jihad vs. McWorld," by Benjamin Barber (March, 1992)**

"The two axial principles of our age -- tribalism and globalism -- clash at every point except one: they may both be threatening to democracy."

Writing in these pages, Benjamin Barber ("Jihad vs. McWorld," March, 1992, *Atlantic*) described market forces that "mesmerize the world with fast music, fast computers, and fast food -- with MTV, Macintosh, and McDonald's, pressing nations into one commercially homogeneous global network: one McWorld tied together by technology, ecology, communications, and commerce." Affluent citizens of South Korea, Thailand, India, Brazil, Mexico, and many other rapidly developing nations have joined with Americans, Europeans, Japanese, and others to form an urban and cosmopolitan international society. Those who participate in this global network are less and less beholden to local customs and traditions. Meanwhile, ethnic, tribal, and other cultural groups that do not dissolve into McWorld often define themselves in opposition to it -- fiercely asserting their ethnic, religious, and territorial identities.

The imposition of a market economy on traditional cultures in the name of development -- for example, the insistence



that everyone produce and consume more -- can dissolve the ties to family, land, community, and place on which indigenous peoples traditionally rely for their security. Thus development projects intended to relieve the poverty of indigenous peoples may, by causing the loss of cultural identity, engender the very powerlessness they aim to remedy. Pope Paul VI, in the encyclical *Populorum Progressio* (1967), described the tragic dilemma confronting indigenous peoples: "either to preserve traditional beliefs and structures and reject social progress; or to embrace foreign technology and foreign culture, and reject ancestral traditions with their wealth of humanism."

**From the  
archive:**

- **"The Vanity of Human Markets"** (February, 1997)

An Atlantic Unbound interview with Robert Kuttner, author of *Everything for Sale*.

The idea that everything is for sale and nothing is sacred -- that all values are subjective -- undercuts our own moral and cultural commitments, not just those of tribal and traditional communities. No one has written a better critique of the assault that commerce makes on the quality of our lives than Thoreau provides in *Walden*. The cost of a thing, according to Thoreau, is not what the market will bear but what the individual must bear because of it: it is "the amount of what I will call life which is required to be exchanged for it, immediately or in the long run."

Many observers point out that as we work harder and consume more, we seem to enjoy our lives less. We are always in a rush -- a "Saint Vitus' dance," as Thoreau called it. Idleness is suspect. Americans today spend less time with their families,

neighbors, and friends than they did in the 1950s. Juliet B. Schor, an economist at Harvard University, argues that "Americans are literally working themselves to death." A fancy car, video equipment, or a complex computer program can exact a painful cost in the form of maintenance, upgrading, and repair. We are possessed by our possessions; they are often harder to get rid of than to acquire.

That money does not make us happier, once our basic needs are met, is a commonplace overwhelmingly confirmed by sociological evidence. Paul Wachtel, who teaches social psychology at the City University of New York, has concluded that bigger incomes "do not yield an increase in feelings of satisfaction or well-being, at least for populations who are above a poverty or subsistence level." This cannot be explained simply by the fact that people have to work harder to earn more money: even those who hit jackpots in lotteries often report that their lives are not substantially happier as a result. Well-being depends upon health, membership in a community in which one feels secure, friends, faith, family, love, and virtues that money cannot buy. Robert Lane, a political scientist at Yale University, using the concepts of economics, has written, "If 'utility' has anything to do with happiness, above the poverty line the long-term marginal utility of money is almost zero."

Economists in earlier times predicted that

wealth would not matter to people once they attained a comfortable standard of living. "In ease of body and peace of mind, all the different ranks of life are nearly upon a level," wrote Adam Smith, the eighteenth-century English advocate of the free market. In the 1930s the British economist John Maynard Keynes argued that after a period of great expansion further accumulation of wealth would no longer improve personal well-being. Subsequent economists, however, found that even after much of the industrial world had attained the levels of wealth Keynes thought were sufficient, people still wanted more. From this they inferred that wants are insatiable.

Perhaps this is true. But the insatiability of wants and desires poses a difficulty for standard economic theory, which posits that humanity's single goal is to increase or maximize wealth. If wants increase as fast as income grows, what purpose can wealth serve?

Critics often attack standard economic theory on the ground that economic growth is "unsustainable." We are running out of resources, they say; we court ecological disaster. Whether or not growth is sustainable, there is little reason to think that once people attain a decent standard of living, continued growth is desirable. The economist Robert H. Nelson recently wrote in the journal *Ecological Economics* that it is no longer possible for most people to believe that economic progress will "solve

all the problems of mankind, spiritual as well as material." As long as the debate over sustainability is framed in terms of the physical limits to growth rather than the moral purpose of it, mainstream economic theory will have the better of the argument. If the debate were framed in moral or social terms, the result might well be otherwise.

## Making a Place for Nature

**From the archive:**

- **Flashback: John Muir's Yosemite** (May, 1997)

Excerpts from the journals of a young amateur naturalist who changed our relationship to the land.

- **"Chesuncook,"** by Henry David Thoreau (Summer, 1858)

"Strange that so few ever come to the woods to see how the pine lives and grows and spires, lifting its evergreen arms to the light, -- to see its perfect success; but

**A**CCORDING to Thoreau, "a man's relation to Nature must come very near to a personal one." For environmentalists in the tradition of Thoreau and John Muir, stewardship is a form of fellowship; although we must use nature, we do not value it primarily for the economic purposes it serves. We take our bearings from the natural world -- our sense of time from its days and seasons, our sense of place from the character of a landscape and the particular plants and animals native to it. An intimacy with nature ends our isolation in the world. We know where we belong, and we can find the way home.

In defending old-growth forests, wetlands, or species we make our best arguments when we think of nature chiefly in aesthetic and moral terms. Rather than having the courage of our moral and cultural convictions, however, we too often rely on economic arguments for protecting nature, in the process attributing to natural objects more instrumental value than they have. By claiming that a threatened species may harbor lifesaving drugs, for example, we

most are content to behold it in the shape of many broad boards brought to market, and deem that its true success. "

impute to that species an economic value or a price much greater than it fetches in a market. When we make the prices come out right, we rescue economic theory but not necessarily the environment.

There is no credible argument, moreover, that all or even most of the species we are concerned to protect are essential to the functioning of the ecological systems on which we depend. (If whales went extinct, for example, the seas would not fill up with krill.) David Ehrenfeld, a biologist at Rutgers University, makes this point in relation to the vast ecological changes we have already survived. "Even a mighty dominant like the American chestnut," Ehrenfeld has written, "extending over half a continent, all but disappeared without bringing the eastern deciduous forest down with it." Ehrenfeld points out that the species most likely to be endangered are those the biosphere is least likely to miss. "Many of these species were never common or ecologically influential; by no stretch of the imagination can we make them out to be vital cogs in the ecological machine."

**From the archive:**

- **"Empowering Species," by Charles C. Mann and Mark L. Plummer (February, 1995)**

Species may be profoundly important for cultural and spiritual reasons, however. Consider again the example of the wild salmon, whose habitat is being destroyed by hydroelectric dams along the Columbia River. Although this loss is unimportant to the economy overall (there is no shortage of salmon), it is of the greatest significance to the Amerindian tribes that have traditionally subsisted on wild salmon, and to the region

"The best way to save endangered species may be to help them pay their own way. "

• **"The Butterfly Problem,"** by **Charles C. Mann and Mark L. Plummer** (January, 1992)

"Because the government doesn't have the means to preserve endangered species, let alone a coherent plan its decisions are haphazard -- and private landowners often find themselves paying for the preservation of species they've never heard of. "

• **"Can Selfishness Save the Environment?,"** by **Matt Ridley and Bobbi S. Low** (September, 1993)

"Conventional

as a whole. By viewing local flora and fauna as a sacred heritage -- by recognizing their intrinsic value -- we discover who we are rather than what we want. On moral and cultural grounds society might be justified in making great economic sacrifices -- removing hydroelectric dams, for example - - to protect remnant populations of the Snake River sockeye, even if, as critics complain, hundreds or thousands of dollars are spent for every fish that is saved.

Even those plants and animals that do not define places possess enormous intrinsic value and are worth preserving for their own sake. What gives these creatures value lies in their histories, wonderful in themselves, rather than in any use to which they can be put. The biologist E. O. Wilson elegantly takes up this theme: "Every kind of organism has reached this moment in time by threading one needle after another, throwing up brilliant artifices to survive and reproduce against nearly impossible odds." Every plant or animal evokes not just sympathy but also reverence and wonder in those who know it.

In *Earth in the Balance* (1992) Al Gore, then a senator, wrote, "We have become so successful at controlling nature that we have lost our connection to it." It is all too easy, Gore wrote, "to regard the earth as a collection of `resources' having an intrinsic value no larger than their usefulness at the moment." The question before us is not whether we are going to run out of

wisdom has it that the way to avert global ecological disaster is to persuade people to change their selfish habits for the common good. A more sensible approach would be to tap a boundless and renewable resource: the human propensity for thinking mainly of short term self-interest. "

resources. It is whether economics is the appropriate context for thinking about environmental policy.

Even John Stuart Mill, one of the principal authors of utilitarian philosophy, recognized that the natural world has great intrinsic and not just instrumental value. More than a century ago, as England lost its last truly wild places, Mill condemned a world

with nothing left to the spontaneous activity of nature; with every rood of land brought into cultivation, which is capable of growing food for human beings; every flowery waste or natural pasture ploughed up; all quadrupeds or birds which are not domesticated for man's use exterminated as his rivals for food, every hedgerow or superfluous tree rooted out, and scarcely a place left where a wild shrub or flower could grow without being eradicated as a weed in the name of improved agriculture.

The world has the wealth and the resources to provide everyone the opportunity to live a decent life. We consume too much when market relationships displace the bonds of community, compassion, culture, and place. We consume too much when consumption becomes an end in itself and makes us lose affection and reverence for the natural world.

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