

should be subtracted from our national income as intermediate costs of the goods whose production or consumption imposes them — but instead we add them to our gross national product, and politicians, along with their academic magicians and media jesters, rejoice in the “improvement” of the economy.

Add to these considerations the corrosive effects of economic growth on community and on moral standards. Capital and labor mobility rips communities apart in the name of growth. Further, an economy that must grow must also sell. It is easier to sell in a community with low standards — if anything goes, then nearly anything will sell, no matter how tawdry or shoddy. Common prudence is now referred to negatively as “sales resistance.”

We have plenty of landmarks to suggest that we have overshot the optimal scale of the human economy (not the least of which is the declining capacity of the earth to support life in the future). But many readers will consider that too impressionistic a judgment. They will ask for numbers. In the Middle Ages holy thought had to be expressed in Latin; today it must be expressed in numbers. Aware that numbers can indeed be useful, Clifford and John Cobb and I developed an Index of Sustainable Economic Welfare (ISEW) for the United States. What we found, briefly, is that there is very little evidence that welfare in the U.S. has been correlated positively with gross national product since 1947. There *is* evidence, however, that in the 1980s the correlation turned negative.

The consumer society must pay attention to what Al Gore said in his excellent but too-soon forgotten book, *Earth in the Balance* (1992): “our civilization is, in effect, addicted to the consumption of the earth itself.” We absolutely must break that addiction.

— Herman E. Daly

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Limits to Consumption and Economic Growth: The Middle Ground

All too many discussions of consumption and related issues tend toward the extremes: the Malthusian position that we are about to exceed the Earth's carrying capacity, to run out of resources, or to exceed the Earth's capacity to absorb pollution; or the Cornucopian position that the Earth's bounty, coupled with human ingenuity and markets, will surmount all obstacles and provide an ever-rising stream of economic goods, food, technologies, and so on. These positions — stated in their most general and sweeping terms — are suspect on basic principles, as we shall shortly illustrate. The Malthusian argument suffers an

additional burden; historically, it has been demonstrably wrong, so far.

The fallacy of both extreme positions is perhaps most easily exposed by considering what is meant by the term “consumption.” When economists use the term, they have in mind all the economic value that is produced by human activity, less only that which is saved; all else is, in this usage, “consumed,” even intangibles such as legal services or television shows. By this definition, economic growth automatically implies growth in consumption. This is true but meaningless, at least with respect to the environment. If the

additional economic activity imposes no environmental burden, then neither does the consumption that results.

Physical scientists, on the other hand, use "consumption" to mean conversion of matter or energy to an altered state, as in the consumption of iron ore to produce steel or the consumption of coal to produce electric power. Whether economic growth implies rising consumption in this sense depends on the precise nature of the economic activity which is increasing, that is to say, on the pattern of consumption. Rising sales of software need not imply any increase in the consumption of iron or of coal; indeed, they may imply a decrease, if software contributes to more efficient use of electricity. Thus economic growth may or may not face resource limits or place additional burdens on the environment — the case remains open, pending closer investigation.

It is worth remembering that carrying capacity is dependent on technology and social organization and hence changes over time.

Biological scientists, to give a third usage of the term, often focus on the consumption of food or other biologically produced resources and on carrying capacity — the presumed limit of the Earth's ability to produce such resources. This third sense of consumption does have a certain resonance with today's circumstances: overharvesting of many marine fisheries has led to a peak in the world's fish catch, and overuse is visibly degrading some other biological resources. But it is worth remembering that carrying capacity is dependent on technology and social organization and hence changes over time. England supports far more people today than Malthus believed possible, and American farmers (less than 3 percent of the U.S. population, compared with 30 to 40 percent a century ago) feed a much larger population and regularly produce surpluses. It is increasingly possible, in principle, to decouple food production from the environment, wholly or partially (consider aquaculture, the source of the most rapidly growing portion of the world's fish catch). For all these reasons, the relation of economic growth to consumption, and of consumption to environmental harm, is more complex, and more context-specific, than might first appear.

I suggest that a careful examination of actual "consumption" patterns and their environmental effects supports a middle position. We are not, the evidence suggests, running out of subsoil or "nonrenewable" resources — minerals, fuels, and so on. Proved

reserves have increased over the past twenty years, and commodity prices are down. Substitution (of optical fibers made from abundant silicon for copper wires, for example) is occurring, recycling is rising, and markets appear to be performing their allocative function. No apparent "limits to growth" can be seen in this direction.

But — Cornucopians, please take note — we are encountering scarcities of many "renewable" resources and degradation of the biological systems which produce or support them. In effect, we are "mining" many biological resources in ways that render them nonrenewable. Thus fish and fisheries, wood and the forests which produce it (wood is the one basic commodity for which prices have risen over the past twenty years), water and watersheds or aquifers (in many but not all regions), and fertile soils are all showing signs of stress and decreasing per capita availability. Even fresh air, the most basic of renewable resources, is becoming an endangered resource in some urban areas, where the scale of human activity overwhelms natural renewal processes.

Close examination of the pattern of degradation shows that some of it is associated with consumption by the wealthy. It is high-tech fishing boats from industrialized countries that are stripping the marine fisheries, and it is industrial use of oil and coal that is priming the Earth's atmosphere with greenhouse gases. Such consumption may rise with economic growth, if human society does not take measures to prevent it; unaided, the market will not.

Some of the degradation, however, is associated with the unplanned "consumption" of the world's poorest populations, who must depend directly upon natural ecosystems for most of their food, fiber, fuel, and often shelter. Markets cannot work for the 20 percent or more of the world's population who have no money to buy and who live a subsistence existence. Economic growth here, if it raised populations out of absolute poverty and gave them economic choices, might actually reduce consumption from — and degradation of — the most overstressed portions of the biological resource base. If they could afford it, people might burn kerosene or use electricity, rather than burn trees. And it is trees (and the watersheds and forests they anchor) and other renewable resources that appear the most threatened.

The Future of Growth

What of the future? Suppose that we can reduce poverty, and the environmental damage associated with it, through jobs and economic growth. Such development would stabilize biological resources that are now at risk. But can a global industrial system expand indefinitely? Will economic growth and expanding human populations not rapidly "consume"

all available energy and material resources, and produce more pollution than living things can tolerate?

Perhaps. But notice that in the industrial countries, per capita use of materials and energy has not grown significantly in twenty years. Indeed, structural shifts under way in the economy — toward services and knowledge-based activities rather than manufacturing and materials-based activity as the primary source of economic value — coupled with rapidly advancing information (and other) technologies make it plausible, if not at all certain, that per capita “consumption” of materials and energy could decline radically over the next fifty years. Knowledge workers do not generate the same consumption patterns as steel workers: production and consumption of software worth \$100 has a far smaller environmental impact than production and consumption of an equivalent value of steel.

Set against these optimistic trends, however, is the reality that per capita consumption of energy and materials in developing countries — now far lower than in the developed world — will inevitably rise, even as population continues to grow. So global consumption, and many kinds of environmental problems, will rise, at least in the short term. Use of fossil fuels — and emissions of greenhouse gases — may double or even triple by the middle of the next century, so that we are likely to find out the real environmental consequences of global warming. Other forms of pollution, concentrated by swelling urban populations, will cause increasing local and regional degradation.

Such trends will continue until population growth stabilizes and the basic infrastructure for urban and industrialized societies is built in developing countries. Progress toward these goals is occurring at different rates in different regions and, on current prognosis, is unlikely to be complete before the middle of the next century. How rapidly the process goes forward, and the extent to which developing countries can make use of emerging technologies to build more energy-efficient, less resource-intensive infrastructures and economic patterns, will determine the overall environmental impact of global development. Here, explicit policies, and the leadership example (or lack of it) in the industrial countries, will certainly play a crucial role.

The consequences of global warming and the resulting changes in climate are not known with any certainty; they may well be quite significant. But human societies have adjusted to other significant changes in climate; we are very adaptable creatures, especially over a half-century or more. And even though local and regional pollution may get worse before it gets better, the evidence suggests that as people’s living standards rise, so do their demands for clean air, clean water, and other environmental amenities — things we do

know how to achieve, after all. Indeed, just such demands have resulted in reductions in pollution in most industrial countries over the past twenty-five years, even with economic growth. So the prospect that, over the next half-century, India and China may achieve living standards and consumption patterns of a typical European country today (Spain, for example) is hardly the end of the world. This is especially true if we continue to use energy and materials ever more efficiently, which is the trend in both the advanced countries and in many newly industrialized countries as well. Eventually, if we are to stabilize the climate, all human societies will have to depend largely on energy sources other than fossil fuels.

The Sources of Wealth

One way to consider what human societies might aspire to is to inquire into the sources of wealth in the broadest sense of that term. A recent and unusually bold study by the World Bank dares to provide estimates of the real wealth of nations — that is, not just their material possessions or “built” capital, but also the “natural” capital represented by biological and mineral resources and the “social” and human capital represented by people, their abilities, and their social organizations. The Bank finds that by far the greatest portion of national wealth in all but the poorest nations comes from human capital, and that developed nations differ from developing ones primarily in having a greater proportion of their wealth in the form of human capital.

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Consider each form of wealth separately. We are gradually depleting some of the Earth’s natural capital, such as oil deposits, but there are potential substitutes (solar energy, for example). And the Earth replenishes other forms of natural capital, such as trees (provided we do not clear the forests faster than they can regrow). Built capital can continue to accumulate, but it appears that we have already seen a saturation point in the more industrialized countries — limits to the demand for more consumption of this type rather than limits to material growth. For human and social capital, however, there appear to be no limits — no limits to the knowledge we can accumulate, to aesthetic achievement, to the desirability of more effective social organizations. If we can organize our economies

so that their consumption patterns favor accumulation of human capital rather than material capital, then the human future would appear to be unbounded. It may even be worth trading some of our original inheritance, natural capital, for increased human capital, if that is the cost of redeeming human assets out of poverty and degradation.

So I assert that the relation between economic growth, consumption, and the environment is neither clearly an unalloyed good nor a proven evil. Basic principles and the available evidence both suggest a rather more complex — and mixed — assessment. Meanwhile, our consumption patterns *are* changing. More than 70 percent of U.S. economic activity is already based on services, rather than on manufacturing, and the percentage is climbing in virtually all countries. By means of vigorous policy, consumption

patterns can be induced to change even further, in ways that would secure a more environmentally promising future. Note, however, that I do not predict such a future — the issue is still in doubt, and depends on decisions and actions still to be taken, separately, in many regions of the world.

— Allen L. Hammond

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Consumption and Well-Being

Long before many of us began to think philosophically about consumption, we read our children stories that really were parables of consumption, though we did not fully realize this at the time. Some of these stories told of characters who behave foolishly, like the fox hungering for grapes that hang beyond his reach. Others presented characters we might envy for their discernment and good luck. For example, when Goldilocks visits the three bears she has such a sure sense of what is too much, what is not enough, and what is "just right." What is equally fortunate, the right stuff — although it belongs to the three bears and not to her — is readily available. The porridge is at the right temperature; a chair and bed are at the right degree of hardness. And Goldilocks, faced with an array of material goods, unerringly chooses the right thing.

We — consumers in American society — are not usually so lucky. With respect to many consumer goods, we don't know what is too much, what is not enough, and what is just right. Often the right goods are nowhere to be found. When they are available, we frequently fail to choose wisely. Many of us realize that we need a better criterion for selection than advertising's image of the good life — if we are to make wise consumption choices, if we are to know what should count as overconsumption, underconsumption, and appropriate consumption.

A given consumption practice may be justifiable or defective in one or more of four ways. First, it may be good or bad for the environment. Some consumer choices deplete scarce resources or damage nature, whereas others contribute to a sustainable way of life. Second, consumption may help or harm other people — our fellow citizens, our descendants, or people in other countries. The benefit or harm I have in mind here is sometimes indirect. For example, in buying moderately priced and fashionable sportswear, we may be a factor in the existence of sweatshops in our own country and abroad; in devoting much or all of our income to personal comforts, we may neglect to assist others less fortunate than ourselves. Third, our consumption practices may affirm or undermine values and institutions deemed essential to our community. Widespread choice of private schooling, for example, may weaken public education and social equality. Deciding to buy a house in the inner city rather than in a suburban neighborhood may strengthen urban institutions aspiring to cultural and class diversity. Finally, a consumption choice or pattern may be beneficial or detrimental to a person's own well-being — apart from its effect on institutions, other people, or the natural world.

My main purpose here is to investigate this fourth way of assessing consumption. What role should goods and services play if our lives are to go well? What