

than ever before and do more to accommodate regional and ethnic tastes.

A Livable World

Moral, social, and cultural critiques of consumption continue to appear in the literature of economics, psychology, and other disciplines. At the same time, fears about the environmental "sustainability" of affluence have assumed a new importance in the centuries-long debate about consumption. The destruction of nature, the depletion of resources, and signs of global ecological stress suggest to many that American levels and patterns of consumption, if extended to the rest of the world's people, would overwhelm the earth's capacity to provide resources and assimilate wastes. Whether or not we must produce and consume *less*, we must surely produce and consume *differently* if we are to protect nature and leave to the future a livable world.

This *Report* begins with two contrasting essays on the environment and the question of limits. It then takes up the themes of individual well-being and social justice, emulation and autonomy, social reform and public policy that dominated the Maryland conference.

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— Mark Sagoff

Sources: David Hume, *An Enquiry Concerning the Principles of Morals* (first edition, 1751; Hackett, 1983); Daniel Horowitz, *The Morality of Spending* (Johns Hopkins, 1985); David M. Potter, *People of Plenty: Economic Abundance and the American Character* (University of Chicago Press, 1954); Christopher Lasch, *The True and Only Heaven: Progress and its Critics* (W. W. Norton, 1991); Michael Schudson, *Advertising, the Uneasy Persuasion: Its Dubious Impact on American Society* (Basic Books, 1984); Colin Campbell, *The Romantic Ethic and the Spirit of Modern Consumerism* (Blackwell, 1987); Stanley Lebergott, *Pursuing Happiness: American Consumers in the Twentieth Century* (Princeton University Press, 1993); Gary Cross, *Time and Money: The Making of Consumer Culture* (Routledge, 1993); Herbert Gans, *Popular Culture and High Culture: An Analysis and Evaluation of Taste* (Basic Books, 1974); Elihu Katz and Paul Lazarsfeld, *Personal Influence: The Part Played by People in the Flow of Mass Communications* (Free Press, 1955).

Consumption and the Environment

There are limits to the total amount of resources that the human economy can consume from the ecosystem that contains it; for the ecosystem — both as supplier of resources and as absorber of waste products — is itself limited. The earth-ecosystem is finite, non-growing, and materially closed. Though it is open to the flow of solar energy, that flow is also non-growing and finite, even if quite large and currently underutilized. Historically, the limits of the ecosystem were not binding upon economic growth, because the economy was small relative to the total ecosystem. The world was "empty." But now it is "full," and the limits are more and more binding — not necessarily like brick walls, but more like tightly stretched rubber bands.

The total flow of resource consumption, or throughput, is the product of population times per capita consumption. John Stuart Mill, writing in 1857, foresaw that increasing the resource flow, and thus moving

from an empty to a full world, would eliminate more and more of life's pleasantness and eventually lead to impossible demands upon the earth:

Nor is there much satisfaction in contemplating the 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 plowed 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. If the earth must lose that great portion of its pleasantness which it owes to things that the unlimited increase of wealth and population would extirpate from it, for the mere purpose of enabling it to support a larger, but not a better or a happier population, I sincerely hope, for the sake of posterity, that they will be content to be stationary, long before necessity compels them to it.

Today there is widespread recognition of the importance of slowing population growth, and incipient attention to the challenge of limiting the growth of per capita consumption. As the quotation from Mill demonstrates, concern about unlimited resource use is hardly new. Yet there is also a history of wishful thinking on these matters. Consider, in this light, the theory of the "demographic transition," which holds that population growth will stop if only per capita consumption reaches a certain level. Some believers in the demographic transition urge us to count on economic growth alone to reduce population pressures and forestall resource scarcities. But it is not very reassuring to hear that one term of a product will stop growing if only the other term grows faster, when it is the product of the two terms that must be limited. Will the average Indian's consumption have to rise to that of the average Swede before Indian fertility falls to the Swedish level? Can the eroded and crowded country of India support that many cars, power plants, buildings, and so on?

One way out of this dilemma is the technological fix frequently referred to as "dematerialization." The Wuppertal Institute in Germany, one of the places where interesting work is being done on the subject, uses this somewhat extravagant term to mean "improved resource use." The Institute explicitly calls for technology to improve resource productivity by a factor of ten — a reasonable goal and a way to buy valuable time to deal with more fundamental problems. But some technological optimists get carried away with dematerialization; they seem to imagine that soon we will have no use for material resources at all. To hear them talk, one would think that McDonald's was about to introduce the "info-burger," consisting of a thick patty of information between two slices of silicon, thin as communion wafers so as to emphasize the symbolic and spiritual nature of consumption. But in truth, though we can certainly eat lower on the food chain, we cannot eat recipes. The Information Reformation, like the demographic transition before it, expands a germ of truth into a whale of a fantasy.

While all countries must worry about both population and per capita consumption, it is evident that the South needs to focus more on population, and the North more on per capita consumption. This fact will continue to play a major role in North/South treaties and discussions. Why should the South control its population if the resources saved thereby are merely gobbled up by Northern overconsumption? Why should the North control its overconsumption if the saved resources will merely allow a larger number of poor people to subsist at the same level of misery? Without for a moment minimizing the necessity of population control, it is nevertheless incumbent on the

North to get serious about consumption control, and not simply wish that dematerialization and the demographic transition will come to the rescue. Toward this end, a reconsideration of the meaning of consumption is offered below.

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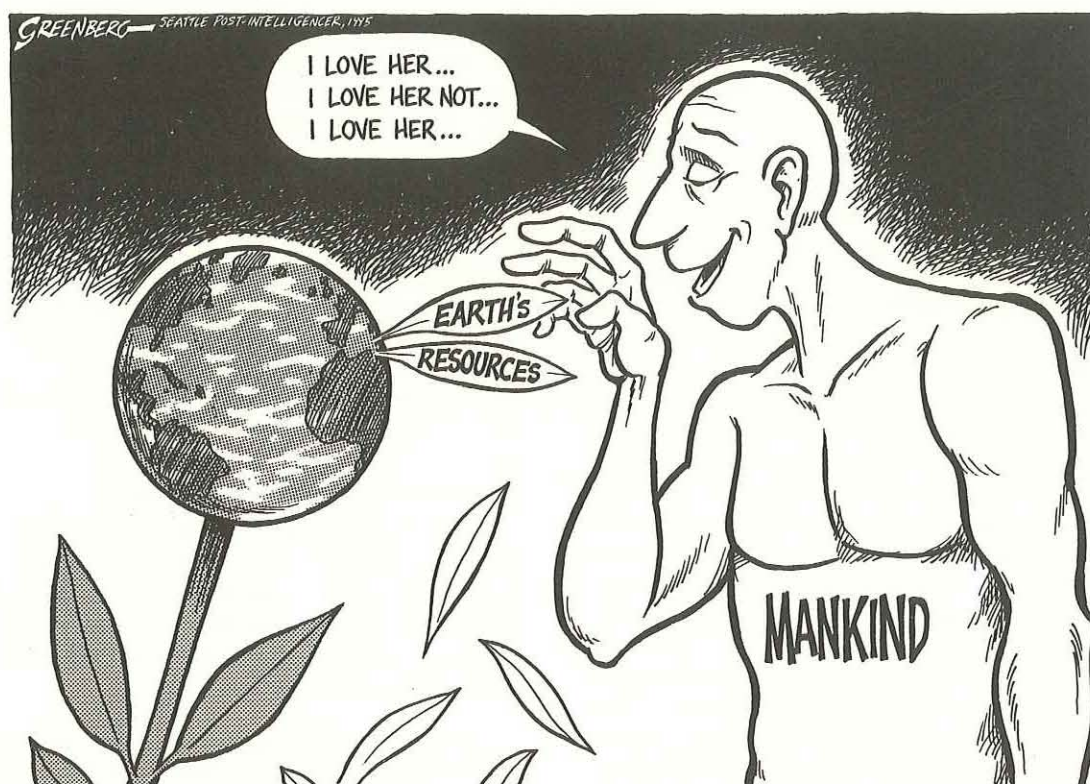
Consumption and Value Added

When we speak of consumption, what is it that we think of as being consumed? Alfred Marshall, the great synthesizer of neoclassical economics, reminded us of the laws of conservation of matter and energy, and the consequent impossibility of consuming the material building blocks of commodities.

Man cannot create material things. . . . [H]is efforts and sacrifices result in changing the form or arrangement of matter to adapt it better for the satisfaction of wants. . . . [A]s his production of material products is really nothing more than a rearrangement of matter which gives it new utilities; so his consumption of them is nothing more than a disarrangement of matter, which diminishes or destroys its utilities.

What we destroy or consume in consumption is the improbable arrangement of those building blocks, arrangements that give utility for humans, arrangements that were, according to Marshall, made by humans for human purposes. Human beings add utility to matter/energy — this is what we mean by production; we do not create matter/energy itself. Useful structure is added to matter/energy by the agency of labor and capital stocks. The value of this useful structure imparted by labor and capital is what economists call "value added." This value added is what is "consumed," or used up, in consumption. That to which value is being added is the flow of natural resources, conceived ultimately as the indestructible building blocks of nature.

In the passage above, Marshall refers to "new utilities" added by human beings, thus leaving open the possibility that matter might have some preexisting utility. But subsequent economists, in emphasizing new utilities or value added, have neglected to consider any value that nature has already provided. In the standard economic-textbook view, we consume *only* that value which we have added to natural resource flows in the first place. And then we add it again, and consume it again, without end. This vision is formalized in the famous diagram of the isolated circular



Steve Greenberg
Seattle Post-Intelligencer

flow of exchange value between firms (production) and households (consumption), found in the initial pages of every economics textbook.

Thus, for all the focus on value added, modern economists have remarkably little to say about *that to which value is being added*. It is just "matter," and its properties are not very interesting. In fact, they are becoming ever *less* interesting to economists as science uncovers their basic uniformity. As Barnett and Morse put it in their classic study, *Scarcity and Growth*:

Advances in fundamental science have made it possible to take advantage of the uniformity of [matter/energy] — a uniformity that makes it feasible, without preassignable limit, to escape the quantitative constraints imposed by the character of the earth's crust.

That to which value is being added are merely homogeneous, indestructible building blocks — atoms in the original sense — of which there is no conceivable scarcity. That to which value is added is therefore inert, undifferentiated, interchangeable, and superabundant — very dull stuff indeed, compared to the value-adding agents of labor with all its human capacities, and capital that embodies the marvels of human knowledge. It is not surprising that value added is the centerpiece of economic accounting, and that the pre-

sumably passive stuff to which value is added has received minimal attention.

Consumption and Physical Transformation

In fact, however, matter/energy is not at all uniform in the quality most relevant to economics — namely, the capacity to receive and hold the rearrangements dictated by human purpose, the capacity to receive the imprint of human knowledge, the capacity to embody value added. Physicists have recognized this quality of matter/energy in the famous Second Law of Thermodynamics, the Entropy Law. One implication of the Entropy Law is that the capacity of matter/energy to embody value wears out and must be replenished. Thus, if the economic system is to keep going, it cannot be an isolated circular flow, as the textbooks suppose. It must be an open system, receiving matter and energy *from* outside to make up for that which is dissipated *to* the outside. What is outside? The environment. What is the environment? It is, again, a complex ecosystem that is finite, non-growing, and materially closed, while open to a non-growing flow of solar energy. Its limited capacities for renewal must be respected by the economic subsystem.

Consumption, then, involves not only disarrangement within the economic subsystem, but also in the rest of the system, the environment, as well. Taking matter/energy from the larger system, adding value to it, using up the added value, and returning the waste, clearly alters the environment. The matter/energy we return is not the same as the matter/energy we take in. If it were, we could simply use it again and again in a closed circular flow. Common observation tells us, however, and the Entropy Law confirms, that waste matter/energy is qualitatively different from raw materials. We irrevocably use up not only the value we add to matter, but also the value that was added by nature before we imported it into the economic subsystem, and that was necessary for it to be considered a resource in the first place. This irrevocable using up of the quality of usefulness of resources does not mean that resources cannot be replenished — rather it means that they *must* be replenished if the system is to continue. Since isolated circular flows are impossible, the replenishment must come from outside, from the environment.

This perspective does not deny that human beings add value to resources by labor and capital. But the value is added to that matter/energy which is most capable of receiving and embodying it. That receptivity might be thought of as “value added by nature.” Carbon atoms scattered in the atmosphere can receive value added only with an enormous expenditure of energy and other materials. Carbon atoms structured in a tree can be rearranged much more easily. Concentrated copper can hold value added; atoms of copper at average crustal abundance cannot. Energy concentrated in a lump of coal can help us add value to matter; energy at equilibrium temperature in the ocean or atmosphere cannot. The more work done by nature, the more concentrated and receptive is the resource to having value added to it, the less capital and labor will have to be expended in rearranging it to better suit our purposes.

From a utility or demand perspective, value added by nature ought to be valued equally with value added by labor and capital. But from the supply or cost side, it is not, because value added by humans has a real cost in labor and an opportunity cost in both labor and capital use. We tend to treat natural value added as a subsidy, a free gift of nature. The greater the natural subsidy, the less the cost of labor and capital needed for further arrangement; the less the humanly added value, the lower the price, and the more rapid the use. Oil from east Texas embodied a much greater net energy subsidy from nature to the economy than does offshore Alaskan oil. But its price was much lower precisely because it required less value added by labor and capital. The larger the natural subsidy, the less we value it!

Thanks in part to natural subsidies, the economy has grown relative to the total ecosystem to such an extent that the basic pattern of scarcity has changed. It used to be that adding value was limited by the supply of agents of transformation, labor and capital. Now, value added is limited more by the availability of resources subsidized by nature to the point that they can receive value added. Mere knowledge means nothing to the economy unless it becomes incarnate in physical structures. No low-entropy matter/energy, no capital — regardless of knowledge. Of course, new knowledge may include discovery of new low-entropy resources, and new methods of transforming them to better serve human needs. But new knowledge may also discover new limits, as when the recognition of damage to the ozone layer required us to reduce emissions of chlorofluorocarbons. At a more fundamental level, science may discover new impossibility theorems. It is useful to remind technological optimists that most of the basic laws of science are statements of impossibility: it is impossible to go faster than light; it is impossible to create or destroy matter/energy; it is impossible to have perpetual motion; it is impossible to have spontaneous generation of life from nonliving things; it is impossible for an organism to live in a medium consisting only of its own waste products, and so on. The success of science and technology is largely based on its intelligent refusal to attempt the impossible. Yet this very success is frequently pointed to by technological optimists as evidence that nothing is impossible.

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The physical growth of the subsystem is the transformation of natural capital into manmade capital. A tree is cut and turned into a table. We gain the service of the table; we lose the service of the tree. In a relatively empty world (small economic subsystem, ecosystem relatively empty of human beings and their artifacts), the service lost from fewer trees was nil, and the service gained from more tables was significant. In today's relatively fuller world, fewer trees means loss of significant services, and more tables are not so important — at least not where most households already have several tables, as in much of the world they do. However, continued population growth will keep the demand for tables up, and we will incur ever greater sacrifices of natural services by cutting more and more trees, as long as population and the number of tables per capita keep growing.

There is both a cost and a benefit to increasing total consumption, and thus the scale of the economic subsystem. The benefit is economic services gained (more tables); the cost is ecosystem services sacrificed (fewer trees to sequester carbon dioxide, provide wildlife habitat and local cooling, prevent erosion, and so on). As scale increases, marginal costs tend to rise, marginal benefits tend to fall. The law of falling marginal benefits is simply a way of saying that, as rational beings, we satisfy our most pressing wants first; after that, we use resources to satisfy wants that are less pressing. The law of increasing marginal costs in like manner means that we first use the cheapest and most easily available resources; after that, we make use of less accessible and less concentrated resources. The intersection of falling marginal benefits and rising marginal costs defines the optimal scale, beyond which further growth would cost more than it is worth — would become anti-economic.

As we come to an optimal or mature scale of economic activity, production is no longer for growth but for maintenance. As Kenneth Boulding argued almost fifty years ago,

Any discovery which renders consumption less necessary to the pursuit of living is as much an economic gain as a discovery which improves our skills of production. Production — by which we mean the exact opposite of consumption, namely, the creation of valuable things — is only necessary in order to replace the stock pile into which consumption continually gnaws.

Consumption and Welfare

The theoretical existence of an optimal scale of the economic subsystem is clear in principle. What remains vague is how to measure the costs and benefits of growth. If economic policy is anything, however, it is the art of reasoning with vague quantities in support of prudent action. We can have reasons for believing that an optimal scale exists, and that we are either above it or below it, without knowing exactly where it is. For policy purposes, a judgment about which side of the optimum we are on is critical.

What are our commonsense judgments about whether we are at, below, or above the optimal scale? To show that we have exceeded the optimum, it is not necessary to show that growth is physically impossible; nor that it has catastrophic costs; nor that it would have negative or zero marginal benefit, even if free. It is only necessary to show that marginal costs are greater than marginal benefits. It is quite logical and reasonable to argue that up to the present time, the total benefits of growth have, on the whole, been greater than the total costs, and yet to hold that growth should cease because at the margin costs have now begun to outweigh benefits.

It is worth emphasizing that benefits from qualitative *development* — technological, social, and moral improvement — are not in question, just those from quantitative *growth*. For example, no one objects to the invention of light bulbs that give more lumens per watt, or the formulation of macroeconomic policies that provide more employment per dollar of GNP whenever we are faced with unemployment. (On second thought, people *do* sometimes object to the latter, in the interests of maximizing growth; but that is exactly the kind of growth idolatry I am complaining about.)

For rich, full countries, the marginal utility of extra growth is surely low. Great sums of money have to be spent on advertising to cajole people into buying more. As we have become goods-rich, we have become time-poor. In rich countries, people die more from stress and overconsumption than from starvation. Relative, rather than absolute, income seems to be the main determinant of self-evaluated welfare, and growth is powerless to increase everyone's relative income. The effect of aggregate growth on welfare in rich countries is therefore largely self-cancelling.

What about the poor? An increase in wealth up from subsistence to middle-class comforts surely increases welfare, if all other things are equal. There is high marginal utility in resource use that improves the lot of the poor. Should this be paid for by cutting the luxury consumption of the rich (which is low in marginal utility), or by converting more natural capital into manmade capital? The rich favor the latter, and perhaps the poor do also, because they want to emulate the rich, and because they doubt the political likelihood of redistribution or imposed limits to the takeover of natural capital. Inequality is converted into pressure for growth.

However, the growth that results from the pressure of inequality often does not go to the poor. Consider for a moment what, exactly, is growing in a growth economy. In the first instance, it is the reinvested surplus that grows. Who controls the surplus? Not the poor. They only get the trickle-down from growth (if that), and even if their absolute well-being increases, their relative position is more likely to worsen than improve as a result of growth. This is especially so in light of the far more rapid rate of population growth of the poor than of the rich (due to greater natural increase and frequently to greater immigration as well). A large and growing supply of labor keeps wages from rising, and thereby also keeps profits up.

A large part of our national income is devoted to expenditures to protect ourselves from the unwanted side effects of increased production and consumption. Health care expenditures rise as a result of tobacco and alcohol consumption, as well as chemical and radioactive poisoning. We pay to clean up oil spills; we spend time and money on commuting. These expenditures

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

Herman E. Daly is senior research scholar in the School of Public Affairs, University of Maryland at College Park. Sources: John Stuart Mill, *Principles of Political Economy*, vol. II (John W. Parker, 1857); Alfred Marshall, *Principles of Economics*, 9th edition (Macmillan, 1961); Harold Barnett and Chandler Morse, *Scarcity and Growth* (Johns Hopkins University Press, 1963); Kenneth Boulding, “Income or Welfare?” *Review of Economic Studies*, vol. 17 (1949); Kenneth Boulding, “The Consumption Concept in Economic Theory,” *American Economic Review*, vol. 35, no. 2 (May 1945); N. Georgescu-Roegen, *The Entropy Law and the Economic Process* (Harvard University Press, 1971); Clifford W. Cobb and John B. Cobb, Jr., *The Green National Product: A Proposed Index of Sustainable Economic Welfare* (University Press of America, 1994); Herman Daly and John B. Cobb, Jr., *For the Common Good*, 2nd edition (Beacon Press, 1994); Al Gore, *Earth in the Balance* (Houghton Mifflin, 1992).

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