

Beacon Press

25 Beacon Street
Boston, Massachusetts 02108-2892

Beacon Press books
are published under the auspices of
the Unitarian Universalist Association of Congregations

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Printed in United States of America

07 06 05 04 10 9 8 7

Text design by John Kane
Composition by Wilsted & Taylor

Library of Congress Cataloging-in-Publication Data
can be found on page 254.

B E Y O N D

G R O W I N G

THE ECONOMICS OF SUSTAINABLE DEVELOPMENT

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Introduction

The Shape of Current Thought on Sustainable Development

Although there is an emerging political consensus on the desirability of something called sustainable development, this term—touted by many and even institutionalized in some places—is still dangerously vague. Apparent agreement masks a fight over what exactly “sustainable development” should mean—a fight in which the stakes are very high.

The power of the concept of sustainable development is that it both reflects and evokes a latent shift in our vision of how the economic activities of human beings are related to the natural world—an ecosystem which is finite, non-growing, and materially closed. The demands of these activities on the containing ecosystem for regeneration of raw material “inputs” and absorption of waste “outputs” must, I will argue, be kept at ecologically sustainable levels as a condition of sustainable development. This change in vision involves replacing the economic norm of quantitative expansion (growth) with that of qualitative improvement (development) as the path of future progress. This shift is resisted by most economic and political institutions, which are founded on traditional quantitative growth and legitimately fear its replacement by something as subtle and challenging as qualitative development. The economics of development without—and beyond—growth needs to be worked out much more fully. There are enormous forces of denial aligned against this necessary shift in vision and analytic effort, and to overcome these forces requires a deep philosophical clarification, even religious renewal.

Sustainable development is a term that everyone likes, but nobody is sure of what it means. (At least it sounds better than “unsustainable nondevelopment.”) The term rose to the prominence of a mantra—or a shibboleth—following the 1987 publication of the U.N.-sponsored Brundtland Commission report, *Our Common Future*, which defined the term as development which meets the needs of the present without sacrificing the ability of the future to meet its needs. While not

vacuous by any means, this definition was sufficiently vague to allow for a broad consensus. Probably that was a good political strategy at the time—a consensus on a vague concept was better than disagreement over a sharply defined one. By 1995, however, this initial vagueness is no longer a basis for consensus, but a breeding ground for disagreement. Acceptance of a largely undefined term sets the stage for a situation where whoever can pin his or her definition to the term will automatically win a large political battle for influence over our future.

Some would like to abandon the concept of sustainable development altogether, arguing that it adds nothing to standard economics and is too vague to ever be useful.¹ But most important concepts are not subject to analytically precise definition—think of democracy, justice, welfare, for example. Important concepts are more dialectical than analytic, in the sense that they have evolving penumbras which partially overlap with their “other.” Analytic concepts have no overlap with their other, so the law of contradiction holds—that is, B cannot be both A and non-A. But for dialectical concepts there are cases in which it makes sense to say that B is both A and non-A.² For example, there is an age at which we are both young and old; a tidal salt marsh is both land and sea; a credit card is both money and non-money. If all our concepts were analytic we could not deal with change and evolution. Analytically defined species could never evolve if they at no time and in no way overlapped with their other. All important concepts are dialectically vague at the margins. I claim that sustainable development is at least as clear an economic concept as money itself. Is money really M1 or M2, or is it M1a? Do we count Eurodollar-based loans in the U.S. money supply? How liquid does an asset have to be before it counts as “quasi-money”? Yet the human mind is clever. Not only can we handle the concept of money, we would have a hard time without it. The same, I suggest, is true for the concept of sustainable development. If economists reject this concept because it is dialectical rather than analytical, then they should also stop talking about money.

While accepting the inherent overlap and vagueness of all dialectical concepts, there still remains much room for giving content to and sharpening the analytical cutting power of the idea of sustainable development. For one thing, the Brundtland definition tells us only that sustainable development means development which does not impoverish the future. This statement implies something about what “sustainable” means in this context, but it does not even try to define “development.” Is there a difference between economic development and economic growth? Does growth mean growth in the total value of goods and services produced during a given time period (GNP, or gross national product)? Or does it mean growth in the rate of flow of matter and energy through a given economic system (physical throughput)? These are some of the issues to be addressed in this book. But before doing so it is useful to recognize that the issues addressed by the concept of sustainable development existed and were actively discussed long before the term itself became customary.

For over twenty-five years the concept of a steady-state economy has been at the center of my thinking and writing.³ John Stuart Mill, back in 1857, discussed this idea under the label “stationary state,” by which he meant a condition of zero growth in population and physical capital stock, but with continued improvement in technology and ethics. Following Mill and the classical economists, I have always thought that this concept was most relevant to “developed” or “mature” economies. During the six years that I worked for the World Bank (1988–1994), I was therefore surprised to see a very similar idea, now called “sustainable development,” become the dominant ideal for the less developed countries (the South), but *not* for the mature, developed countries (the North). In my view, while sustainability is certainly relevant to the South, the critical issue is for the North to attain sustainability in the sense of a level of resource use that is both sufficient for a good life for its population and within the carrying capacity of the environment if generalized to the whole world. Population growth and production growth must not push us beyond the sustainable environmental capacities of resource regeneration and waste absorption. Therefore, once that point is reached, production and reproduction should be for replacement only. Physical growth should cease, while qualitative improvement continues.

Sustainable Development and Classical Economics

The classical economists thought that the economy would naturally end up in the stationary state, with wages at a subsistence level and the surplus all going to landlords as rent, with nothing left over for the capitalist's profit, and therefore no motive for further growth. Most of the classical economists dreaded the stationary state as the end of progress, but Mill welcomed it, recognizing that “a stationary condition of capital and population implies no stationary state of human improvement,” and that in fact there would be more likelihood of “improving the art of living . . . when minds ceased to be engrossed by the art of getting on.” Unlike many classical economists, Mill believed that the laws governing production did not rigidly determine distribution—so that the subsistence-level wage was not a necessary feature of the stationary state. In today's jargon, Mill was arguing for sustainable development—development without growth—that is, qualitative improvement without quantitative increase. But Mill's writings on the stationary state were forgotten, and most economics Ph.D.s from the past two decades have never heard of this concept because their teachers, who had heard of it, rejected it as unworthy of transmission.

The limits that the classical economists saw were basically demographic and ecological—Malthus's iron law of wages and Ricardo's law of increasing differential rent (resulting from the increased competition of a growing population for a fixed amount of land that differs in quality) combined to bid up the premium

paid for superior land (rent) and keep wages at subsistence. In their era there was not such an awareness of overall ecological limits as there is today, although that factor was not entirely absent from their theories. There was more emphasis on a distributive limit as all the surplus ended up in the unproductive hands of landlords—but that accumulation itself resulted from demographic pressure of the growing laboring class and the ecological fact of the differential fertility of land that gave rise to increasing rent on lands of better quality.

Unlike that of the classical economists, today's standard (neoclassical) economic theory begins with nonphysical parameters (technology, preferences, and distribution of income are all taken as givens) and inquires how the physical variables of quantities of goods produced and resources used must be adjusted to fit an equilibrium (or an equilibrium rate of growth) determined by those nonphysical parameters. The nonphysical, qualitative conditions are given and the physical, quantitative magnitudes must adjust. In neoclassical theory this "adjustment" almost always involves growth. Today's newly emerging paradigm (steady state, sustainable development), however, begins with physical parameters (a finite world, complex ecological interrelations, the laws of thermodynamics) and inquires how the nonphysical variables of technology, preferences, distribution, and lifestyles can be brought into feasible and just equilibrium with the complex biophysical system of which we are a part. The physical quantitative magnitudes are what is given, and the nonphysical qualitative patterns of life become variables. This emerging paradigm is more like classical than neoclassical economics in that adjustment is by qualitative development, not quantitative growth.

With the Industrial Revolution, the idea of a stationary state, and classical economics in general, was retired to history. Neoclassical economics, with its subjectivist theory of value, shifted attention away from resources and labor and onto utility, exchange, and efficiency. The subjectivist and marginalist revolution, with its marginal utility theory of value, was certainly an improvement in the understanding of prices and markets. But that gain came at the cost of pushing physical factors too far into the background. Classical considerations of the "real cost" dimension of value (labor and resources) were eclipsed. Today the classical ghost of the stationary state has returned to the ball, uninvited, in the costume of sustainable development. Like Mill, I welcome its presence. And, like Mill, I am in the minority among economists, most of whom resist the very idea, as will be seen in the discussions that follow.

If development means anything concretely it means a process by which the South becomes like the North in terms of consumption levels and patterns. But current Northern levels and patterns are not generalizable to the whole world, assuming anything remotely resembling even our best existing technology, without exceeding ecological carrying capacity—that is, without consuming natural capital and thereby diminishing the capacity of the earth to support life and wealth in the future. It is clear that we already consume natural capital and count it

as current income in our national accounts. One need only try to imagine 1.2 billion Chinese with automobiles, refrigerators, washing machines, and so on, to get a picture of the ecological consequences of generalizing advanced Northern resource consumption levels across the globe. Add to that the ecological consequences from agriculture when the Chinese begin to eat higher on the food chain—more meat, less grain. Each pound of meat requires diversion of roughly ten pounds of grain from humans to livestock, with similarly increased pressure on grasslands and the conversion of forests to pasture.

Might such expansion destroy the ecological capacity of the earth to support life in the future? Perhaps, because such a "liquidation" can be "optimal" in the economists' models. The dominant model excludes ecological costs altogether, but even those models that recognize ecological costs, if they are based on present value maximization, also can lead to "optimal" liquidation. The higher the discount rate, the sooner the liquidation. This anomaly sometimes makes neoclassical economists uneasy, but not always. Their usual assumption is that additional man-made capital substitutes for liquidated natural resources. One place where reality is forcing reconsideration of these models is in the World Bank, probably the world's largest and most generous employer of economists.

Sustainable Development and the World Bank

Certainly the World Bank would be the proper institution to recognize the ecological contradictions in the world's economic development plans, and to call attention to the need for the North to stop growth in resource throughput in order to both reserve for the people of the South the remaining ecological space needed for growth to satisfy their vital needs and set a generalizable and replicable example of sustainable development. The World Bank's best opportunity to date for doing this was through its 1992 World Development Report, entitled *Development and the Environment*. I worked in the Environment Department of the World Bank during that time, and although I was not part of the team that wrote the report, I did have an opportunity to comment on various early drafts and to observe the whole effort from close range.

While the 1992 report made a number of contributions, especially in calling attention to the public health consequences of the environmental degradation of water and air, it nevertheless failed to address the biggest question. Environmental deterioration was held to be mainly a consequence of poverty, and the solution proposed was the same as the World Bank's solution to other economic problems, namely more growth. And this meant not only growth in the South, but also in the North, for how else could the South grow if it could not export to Northern markets and receive foreign investments from the North? And how could the North provide foreign investment and larger markets for the South if it in turn did

not grow? While the World Bank's report acknowledged a few conflicts between growth and environment here and there, the world was seen to be full of "win-win" opportunities for both increasing growth as usual and improving the environment. The message was both a reaffirmation of the Bank's faith in economic growth and a denial of the existence of any fundamental ecological limits to that growth: problems reside mainly in the South, solutions are to be found mainly in the North. This formulation is politically convenient, at the very least, since the Bank is creditor to the South and debtor to the North. It is always easier to preach to your debtors than to your creditors.

The evolution of the manuscript of *Development and the Environment* is revealing. An early draft contained a diagram entitled "The Relationship Between the Economy and the Environment." It consisted of a square labeled "economy," with an arrow coming in labeled "inputs" and an arrow going out labeled "outputs"—nothing more. I suggested that the picture failed to show the environment, and that it would be good to have a large box containing the one depicted, to represent the environment. Then the relation between the environment and the economy would be clear—specifically, that the economy is a subsystem of the environment and depends upon the environment both as a source of raw material inputs and as a "sink" for waste outputs.

The next draft included the same diagram and text, but with an unlabeled box drawn around the economy like a picture frame. I commented that the larger box had to be labeled "environment" or else it was merely decorative, and that the text had to explain that the economy is related to the environment as a subsystem within the larger ecosystem and is dependent on it in the ways previously stated. The next draft omitted the diagram altogether.

By coincidence, a few months later the chief economist of the World Bank, Lawrence H. Summers, under whom the report was being written, happened to be on a conference panel at the Smithsonian Institution, discussing the book *Beyond the Limits* (Donella H. Meadows et al.), which Summers considered worthless. In that book there was a diagram showing the relation of the economy to the ecosystem, a diagram exactly like the one I had suggested (and like the one in figure 3, page 49). During the question-and-answer time I asked the chief economist if, looking at that diagram, he felt that the question of the size of the economic subsystem relative to the total ecosystem was an important one, and whether he thought economists should be asking the question, What is the optimal scale of the macro economy relative to the environment? His reply was immediate and definite: "That's not the right way to look at it."

Reflecting on these two experiences has reinforced my belief that the main issue in the sustainable development controversy truly does revolve around what economist Joseph Schumpeter called "preanalytic vision." My preanalytic vision of the economy as subsystem leads immediately to the questions, How big is the subsystem relative to the total system? How big can it be without dis-

rupting the functioning of the total system? How big should it be? What is its optimal scale beyond which further growth would be antieconomic, would cost more than it's worth? The World Bank's chief economist had no intention of being sucked into addressing these subversive questions, so he dismissed the viewpoint that gave rise to them.

Summers's dismissal was rather peremptory, but so, in a way, was my response to the diagram showing the economy receiving inputs from nowhere and exporting wastes to nowhere. That is not the right way to look at it, I felt, and any questions arising from that incomplete picture—say, how to make the economy grow as fast as possible by speeding up the flow of energy and materials through it—were not the right questions. Unless one has the preanalytic vision of the economy as subsystem, the whole idea of sustainable development—of a subsystem being sustained by a larger system whose limits and capacities it must respect—makes no sense whatsoever. On the other hand, a preanalytic vision of the economy as a box floating in infinite space allows people to speak of "sustainable growth"—a clear oxymoron to those who see the economy as a subsystem. The difference between these two visions could not be more fundamental, more elementary, or more irreconcilable.

It is interesting that such a huge issue should be at stake in a simple picture. Once you draw the boundary of the environment around the economy, you have said that the economy cannot expand forever. You have said that John Stuart Mill was right, that populations of human bodies and accumulations of capital goods cannot grow forever, that at some point quantitative growth must give way to qualitative development as the path of progress.

I believe we are at that point today. But the World Bank cannot say that—at least not yet. It cannot acknowledge limits to growth because growth is seen as the solution to poverty. Historically there is a lot of truth in this view. If we now recognize that growth is physically limited, or even economically limited in that it is beginning to cost more than it is worth at the margin, then how will we lift poor people out of poverty? The answer is painfully simple: by population control, by redistribution of wealth and income, and by technical improvements in resource productivity. In sum, not by growth, but by development. However, in most circles population control and redistribution are considered politically impossible. Increasing resource productivity is considered a good idea until it conflicts with capital and labor productivity, until we realize that in the developed countries we have bought high productivity and high incomes for capital and labor—and thus a reduction in class conflict—by using resources lavishly, in other words, by sacrificing resource productivity. Yet resources are the limiting factor in the long run, and therefore they are the very factor whose productivity economic logic says should be maximized. The temptation to denial becomes politically overwhelming.

When we draw that containing boundary of the environment around the economy we move from "empty-world" economics to "full-world" econom-

ics—from a world where inputs to and outputs from the economy are unconstrained, to a world in which they are increasingly constrained by the depletion and pollution of a finite environment. Economic logic stays the same—economize on the limiting factor. But the perceived pattern of scarcity changes radically—the identity of the limiting factor shifts from man-made capital to our remaining natural capital, from fishing boats to the populations of fish remaining in the sea—therefore policies must change radically. That is why there is such resistance to a simple picture. The fact that the picture is both so simple and so obviously realistic explains why it cannot be contemplated by the growth economists, why they must continue to insist, “That’s not the right way to look at it!”

In the end, the World Bank’s report *Development and the Environment* proved unable to face the most basic question: Is it better or worse for the South if the North continues to grow in its own resource use? The standard answer is that it is better because growth in the North increases markets for Southern exports, as well as funds for aid and investment by the North in the South. The alternative view is that Northern growth makes things worse by preempting the remaining resources and ecological space needed to support economic growth in the South up to a sufficient level, and that it also increases global income inequality and world political tensions. This view urges continued *development* in the North, but not *growth*. These two answers to the basic question cannot both be right. And the absence of that fundamental question from World Bank’s policy research represents a failure of both nerve and intellect, as well as a continuing psychology of denial regarding limits to growth.

A small environmental resistance movement within the Bank tried to get the above question into *Development and the Environment*, not in any central way, because that was clearly impossible, but just as a half-page box raising the issue for future reflection. We were not successful because the orthodox economists correctly realized that reflection on this question was much too dangerous to their whole enterprise. It was as if we were building a skyscraper and, having reached the twentieth floor, some of us were pointing out that the whole structure was out-of-plumb and that if we were to go up another twenty stories it would fall. Architects and investors hate redoing foundations. Orthodox economists have solved all the foundational problems of development theory, they believe, and they have made their professional reputations on the basis of those solutions. They now wish to focus on advanced, “cutting-edge” issues and build this leaning tower of Babel ever higher, making ad hoc corrections as we go. Forget that silly diagram—that’s not the right way to look at it.

Having failed to fundamentally influence *Development and the Environment*, our environmental resistance group put together its own alternative statement, which we tried unsuccessfully to publish within the Bank and then published with UNESCO.⁴ Among our contributors were two Nobel Laureate economists (Jan Tinbergen and Trygve Haavelmo), and the preface was an en-

dorsement by the environment ministers of two of the Bank’s major borrowing countries (José Lutzenburger of Brazil, and Emil Salim of Indonesia). But the Bank could not possibly publish it because it was based on that simple but threatening diagram. I mention the two Nobel Laureate economists not to suggest that counting Nobelites on each side of an issue is the way to resolve it—by that criterion the World Bank’s position would easily win—but just to show that not all economists are unwilling to rethink the assumptions of their discipline. The Norwegian version of the little book even had a nice foreword by Prime Minister Gro Harlem Brundtland, chairman of the famous Brundtland Commission, which had put the whole idea of sustainable development on the agenda. But the World Bank simply could not take it seriously.

Although the World Bank was on record as officially favoring sustainable development, the near vacuity of the phrase made this a meaningless affirmation. Attempts of the environmental resistance group to give the concept a clear definition were vigorously countered. The party line was that sustainable development was like pornography—we’ll know it when we see it, but it’s too difficult to define. Our simple definition—development without growth beyond environmental carrying capacity, where development means qualitative improvement and growth means quantitative increase—just confirmed the orthodox economists’ worst fears about the subversive nature of the idea, and reinforced their resolve to keep it vague.

One way to render any concept innocuous is to expand its meaning to include everything. By 1991 the phrase had acquired such cachet that everything had to be sustainable, and the relatively clear notion of environmental sustainability of the economic subsystem was buried under “helpful” extensions such as social sustainability, political sustainability, financial sustainability, cultural sustainability, and on and on. We expected any day to hear about “sustainable sustainability.” Any definition that excludes nothing is a worthless definition. Yet if one objects to including culture in the definition of sustainable development one is accused of denying the importance of culture. Pretty soon sustainable development was being defined to include even the right to peaceable assembly. The right to peaceable assembly is a good thing, but it is not useful to include all good things in the definition of sustainable development. The term had acquired such vogue that everyone felt that their favorite cause had to be a part of the definition or else be implicitly condemned to oblivion, and this natural confusion was abetted by those in the Bank who wanted to keep the concept vague, to dull its sharp edges enough to keep it from cutting into business as usual—that is, pushing loans in the interest of export-led growth and global integration.

I should say in defense of the World Bank that its environmental standards are generally higher than those of most of its member countries. Only the Netherlands and the Scandinavian countries are really in a position to tell the Bank to improve its environmental standards. The other thing that must be said in the

Bank's defense is that it is like the church—trying to do good in the world according to what its clergy learned in seminary. But the “seminaries” are teaching bad theology. Bank economists, whether from Cameroon or California, all get their training in a handful of academic economics departments, and all learn basically the same economic theology. Frequent academic advisors to the Bank (its chief economist is also usually brought in from academia) keep renewing the flawed theology, reminding everyone, when necessary, that “that’s not the right way to look at it.” I have suggested to friends at Greenpeace that in addition to protesting Bank projects, they should at least once a year go hang a black shroud on the building that houses the MIT economics department (or that of Chicago, Stanford, Oxford, Cambridge, etc.).

Sustainable Development and Academia

In 1994 I decided to leave the World Bank to return to academia. I certainly had no illusion that I was leaving blindness and corruption behind and entering a realm of truth and honesty. I had been in academia before. If I had harbored such an illusion it would have quickly been dispelled by an experience with the MIT Press that taught me that prestigious universities can sometimes be less committed to free speech and open debate than commercial publishers.⁵

There is a better side to academia than the one just mentioned. In 1995, eleven important academic economists and ecologists signed a statement entitled “Economic Growth, Carrying Capacity, and the Environment,” and published it in the policy forum section of the journal *Science*.⁶ There was an explicit agreement among these important thinkers to the effect that (1) “the [environmental] resource base is finite,” (2) “there are limits to the carrying capacity of the planet,” and (3) “economic growth is not a panacea for [diminishing] environmental quality” (italics added). That such obvious propositions still face sufficient opposition to require such a defensively crafted consensus is a sad but accurate commentary on the current state of the academic disciplines of both economics and ecology.

One might have hoped that the authors would have carried the third insight a bit further to consider whether economic growth, in addition to being a false cure, might not also be a major cause of environmental degradation—along with population growth, which also gets short shrift. To make this case they would have had to separate economic growth (defined as expansion of GNP) into its quantitative, physical component (resource throughput growth) and its qualitative, non-physical component (resource efficiency improvement). They might then have reached a further consensus that total throughput growth is indeed the major cause of environmental degradation, while improvements in resource efficiency, by allowing a reduction in throughput or a more benign mix of products, are sparing of the environment. Perhaps they would have then agreed to advocate development

(improvement in resource efficiency) without growth (expansion of resource throughput)—sustainable development. They might have pointed out that growth in this physical sense can be antieconomic, or negative—that, at the margin, throughput growth may cause environmental costs to increase faster than production benefits, thereby making us poorer, not richer. No one is against being richer, but some of us are against becoming poorer as a result of antieconomic growth masquerading as economic growth.⁷ But this is the best to come from mainstream academia, and it is much better than what one hears from most orthodox economists, so one should be grateful.

It has, of course, occurred to me that maybe the orthodox economists are right, and that perhaps we dissidents really are looking at things in the wrong way. So I do try from time to time to see things in the light of their preanalytic vision, and in the light of other visions as well. It requires effort to go against my basic “default settings,” and I am sure the same is true for the growth economists. But let me share some reflections on alternative visions for integrating economics and ecology, for relating the subsystem to the total system.

There are, I believe, three alternative strategies for integrating the economy and the ecosystem that have been discussed in the public forum.⁸ First, the strategy of “economic imperialism,” in which the subsystem, the economy, expands until everything is included. The subsystem becomes identical to the total system, everything is economy and everything has a price. Internalization of externalities has been carried to the limit and nothing remains external to the economy. This seems to be the implicit strategy of neoclassical economics.

The second strategy is to shrink the economy boundary to nothing so that everything is ecosystem. This I call ecological reductionism. All human valuations and choices are held to be explicable by the same evolutionary forces of chance and necessity that presumably control the natural world. Relative values correspond to embodied energy content, and economies, like ecosystems, are governed by the dictates of survival. Some follow this position to its logical conclusion, and view—or at least affect to view—human extinction as no more significant than the extinction of any other species. This seems to be the implicit strategy of those many biologists and ecologists who operate on a philosophy of scientific materialism.

The third strategy is the one adopted here—to view the economy as a subsystem of the ecosystem and to recognize that while it is not exempt from natural laws, neither is it fully reducible to explanation by them. The human economy cannot be reduced to a natural system. There is more to the idea of value than embodied energy or survival advantage. But neither can the economy subsume the entire natural system under its managerial dominion of efficient allocation. This vision of the earth as an alchemist’s centrally planned terrarium, with nothing wild or spontaneous but everything base transformed into gold, into its highest instrumental value for humans, is a sure recipe for disaster.

We cannot get rid of the subsystem boundary, either by expanding it to include the whole system or by collapsing it to include nothing. Too many critical distinctions are lost in either strategy. Therefore we must be concerned with drawing the boundary properly so that we include neither too much nor too little, so that we include and exclude the right things. For now, however, the most pressing need is to stop the exponential expansion of this subsystem boundary under the current regime of economic imperialism—but without falling prey to the seductions of ecological reductionism.

We have a long way to go. The World Bank is still dedicated to expanding the boundary by economic growth as traditionally defined. Academic economists are probably even more dedicated to economic growth. And of course the U.S. government is yet even more committed to growth as a goal. But there are some signs of change. Although Clinton and Gore won on a growth platform, Al Gore as senator had written a very insightful book on problems of environment and economic growth.⁹ We also have the President's Council on Sustainable Development, whose pronouncements merit attention as an authoritative statement of exactly where we are—and how far we have yet to go.

Sustainable Development and U.S. Politics

To get a concrete idea of the degree of political consciousness in the United States regarding sustainable development, we can look at the President's Council on Sustainable Development and their fifteen proclaimed principles on the issue.¹⁰

The council is to be commended for coming up with an initial list of principles and inviting comment, even though *fifteen* principles, where two or three would have sufficed, does not inspire confidence. It is not easy to get consensus on such a difficult issue from such a diverse committee, one which by design and necessity includes members of many different interest groups. Getting consensus on a principle frequently requires reduction of the principle to vacuity—the less you say, the less there is to disagree with. And the less each principle says, the greater is the felt need to add another principle. Still, the council came up with some principles that, while not crystal clear and specific, are not totally vacuous either. And even if some do appear a bit empty or repetitive, this is a further invitation for citizens to provide additional specificity and content, and thus further the discussion.

Below I quote each of the fifteen principles, and add a brief comment aimed at moving the principle toward more specificity and clarity. In most cases my comment would not receive the consensus accorded the original principle precisely because of the added specificity. Although it would be possible to impose a stricter order on the discussion than the one inherent in these fifteen principles, I think it is important to accept them as our framework, even if a loose one, in order to see the extent of present consensus and understanding in all its incompleteness,

and to avoid any possible misrepresentation by paraphrase or summary. References to discussions in the remaining chapters of the book that are relevant to some of the principles helps to fill out the introductory function of this essay.

1. *We must preserve and, where possible, restore the integrity of natural systems—soils, water, air, and biological diversity—which sustain both economic prosperity and life itself.*

Yes, indeed. Restoring natural systems requires reducing our physical demands on those systems (as sources and sinks for the economy) in order to allow them to recuperate. Continuing expansion of the scale of the human economy will require the takeover of ever more of the habitat of other species and is inconsistent with maintaining biodiversity and ecological life-support systems.

Chapters 1, 2, and 4 contribute to this discussion.

2. *Economic growth, environmental protection, and social equity should be interdependent, mutually reinforcing national goals, and policies to achieve these goals should be integrated.*

Maybe these goals *should* be mutually reinforcing, but frequently they conflict. To sort out conflicts and harmonics we must distinguish *growth* (quantitative increase by assimilation or accretion of materials) from *development* (qualitative improvement, realization of potential). The construct “gross national product” conflates these two totally different things, as does the usual concept of economic growth, thought of as growth in GNP. Quantitative increase of the scale of the economy by assimilation or accretion of material from the finite environment is not sustainable. Qualitative improvement and realization of potential may well continue forever—at least we cannot specify any obvious limits to its sustainability. Sustainable development therefore is development without growth—that is without throughput growth beyond the regeneration and absorption capacities of the environment. The path of future progress is development, not growth. This distinction must be made or confusion is inevitable.

Further discussion will be found in Chapters 1, 2, and 5.

3. *Along with appropriate protective measures, market strategies should be used to harness private energies and capital to protect and improve the environment.*

Yes, the market should certainly be the main mechanism for solving the problem of efficient allocation of resources. There are two prior problems that have to be solved politically as the precondition for the market to work in this way. We must politically and socially limit the total scale of resource throughput for key

resources to a level that is sustainable. This provides a sustainable scale. Second, the rights to deplete or pollute up to the scale limit are no longer free goods, but valuable assets. Who owns them? The just distribution of initial ownership has to be settled socially. Only after these context questions of a sustainable scale and a just distribution have been settled socially can the individualistic market solve the question of efficient allocation. We must use the market to solve the allocation question, but we cannot expect it to solve the scale and distribution questions.

This will be elaborated in Chapters 2 and 15.

4. *Population must be stabilized at a level consistent with the capacity of the earth to support its inhabitants.*

This is crucial. For clarity we should add, "... support its inhabitants at a level of per capita wealth sufficient for a good life." We cannot precisely define "a good life," but most would agree with Malthus that it should be such as to permit one to have a glass of wine and a piece of meat with one's dinner. Even if one is a teetotaler or a vegetarian that level of affluence is desirable, and would serve by itself to rule out populations at or above today's level. What really must be stabilized is total consumption, which of course is population times per capita consumption. Both of the latter factors must be reduced.

The nation, not the earth, will be the effective unit in which population and consumption are controlled. Different nations will make different choices: some will not control either population or consumption, others will. Of those that do control total consumption, some will choose high per capita consumption and low population, others will choose the reverse. Free migration, or even free trade with free capital mobility, will undercut any national policies of self-discipline and restraint in consumption and population growth. The current thrust toward economic globalization is, short of the unappealing prospect of world government, likely to be contrary to sustainable development. Setting a successful national example for possible emulation may be the best contribution our own nation can make toward global sustainable development.

These issues are discussed in Chapters 8 and 9.

5. *Protection of natural systems requires changed patterns of consumption consistent with a steady improvement in the efficiency with which society uses natural resources.*

What is needed in the first instance are *reduced levels* of consumption, not just *changed patterns*. We certainly must improve the efficiency with which society uses resources (development), but the best way to do that is to limit the

level of resource throughput (growth), thereby forcing progress onto the path of development rather than growth, as suggested in comment on point 2.

See Chapter 3 for additional discussion.

6. *Progress toward elimination of poverty is essential for economic progress, equity, and environmental quality.*

Elimination of poverty, in the absence of growth (which so far has failed to reduce poverty anyway), will have to come from greater sharing, more population control, and development in the sense of the term here defined. The political difficulty of facing up to sharing, population control, and qualitative development as the real cures to poverty will sorely tempt politicians to resurrect the impossible goal of growth—more for all with sacrifice by none, for ever and ever, world without end, amen. No doubt they will want to call it "sustainable growth"!

Chapters 14 and 15 deal with equity and distribution.

7. *All segments of society should equitably share environmental costs and benefits.*

Yes. This should be done through internalization of environmental costs into prices so that the polluter and the depleter pay. One powerful way to move in this direction is to shift the tax base from income (value added) to throughput (that to which value is added). Why tax what we want more of—employment and income? Why not tax what we want less of—depletion and pollution? This shift could be revenue neutral, and supplemented with a stiff income tax on very high incomes and a negative tax on very low incomes in order to maintain progressivity. Since we have to raise public revenue somehow, and since almost all taxes are distortionary, why not induce the "distortions" we want instead of those we do not want? Equity is served because the polluter and the depleter pay, yet the inevitable regressivity of a consumption tax is countered by a negative income tax on very low incomes and a high tax on very high incomes.

Chapters 5 and 15 deal with related matters.

8. *All economic and environmental decision-making should consider the well-being of future generations, and preserve for them the widest possible range of choices.*

The goal of preserving the range of choice of the present for future generations is certainly central to sustainable development, but it cannot be effected by piecemeal individualistic consideration of the effect of all micro economic and environmental decisions on the future. Protecting the range of options

for the future has to be a macro, social decision, effected through a macro policy such as limiting the scale of throughput. Urging individuals to consider the future generations in their personal economic decisions is necessary but not sufficient.

9. *Where public health may be adversely affected, or environmental damage may be serious or irreversible, prudent action is required in the face of scientific uncertainty.*

Irreducible uncertainty about the environmental effects of new technologies or substances are real economic costs. Like other costs, they should be included in the price and paid for by the consumer of the commodity that has imposed the cost, rather than thrown on the general public. This could be better accomplished by requiring an assurance bond in the amount of possible damage, to be posted up front and then returned over time as experience reduces the uncertainty about damage. Currently the burden of uncertainty is too much borne by the public at large. Our liability laws operate only after the fact, and even then inability to pay is frequent.

10. *Sustainable development requires fundamental changes in the conduct of government, private institutions, and individuals.*

Yes. Some specific changes have been suggested in my comments here on these fifteen principles. While conduct or behavior needs to change, frequently the underlying principle remains the same. For example, it is an accepted principle in economics that in accounting income we must deduct for depreciation of capital in order to keep productive capacity intact. This principle remains, and only needs to be extended to natural capital as well as manmade. Depletion of natural capital is a cost and should be counted in the macro System of National Accounts, in micro project evaluation, and in the international balance of payments.

See Chapters 2, 6, and 7.

11. *Environmental and economic concerns are central to our national and global security.*

True, especially in the sense that countries that are living within a non-growing biophysical budget that is environmentally sustainable are much less likely to go to war with each other than countries that are expanding their consumption of and dependence upon resources belonging to other countries, or to mankind in general—petroleum in the Middle East, for example, or atmospheric capacity to absorb CO₂ or SO₂.

Chapter 10 is relevant here.

12. *Sustainable development is best attained in a society in which free institutions flourish.*

Yes. We must keep in mind that free institutions include not only the institution of individual freedom in the competitive marketplace (freedom from monopoly), but also the social, collective freedom to democratically enact rules for the common good. As emphasized above, the market solution to the efficient allocation problem presupposes a political solution to the problems of sustainable scale and just distribution.

13. *Decisions affecting sustainable development should be open and permit informed participation by affected and interested parties, that requires a knowledgeable public, a free flow of information, and fair and equitable opportunities for review and redress.*

In relation to the above, the old GATT (General Agreement on Tariffs and Trade) and the new WTO (World Trade Organization) are highly suspect, and require considerable changes to come into conformity with this requirement for transparency and other principles of sustainable development.

See Chapters 10 and 11.

14. *Advances in science and technology are beneficial, increasing both our understanding and range of choices about how humanity and the environment relate. We must seek constant improvements in both science and technology in order to achieve eco-efficiency, protect and restore natural systems, and change consumption patterns.*

No one can oppose the advancement of knowledge, but by now it should be clear that not every new technology that comes down the pike is a net benefit to the human race. As E. J. Mishan put it, "While new technology is unrolling the carpet of increased choice before us by the foot, it is often simultaneously rolling it up behind us by the yard." We need technologies of development, technologies that more efficiently digest a given resource throughput, not the technologies of growth, of larger jaws and a bigger digestive tract. And, once again, instead of vaguely calling for "changed consumption patterns" we need to specify "reduced consumption levels" of resources and environmental services. Once the level of resource throughput is reduced to a sustainable level, the pattern of consumption will automatically adapt, thanks to the market. Controlling the pattern directly would require abrogation of the market and would not limit the level of consumption.

15. *Sustainability in the United States is closely tied to global sustainability. Our policies for trade, economic development, aid, and environmental protection must be considered in the context of the international implications of these policies.*

The connection between sustainability and international trade is important, but rather different I think from what the council has in mind. Nearly all policies for sustainability involve internalizing external environmental and social costs at the national level. This makes prices higher. Therefore free trade with countries that do not internalize these costs, or do it to a much lesser extent, is not feasible. In such cases there is every reason for protective tariffs. Such tariffs would be protecting not an inefficient industry or firm but an efficient national policy of cost internalization. Free trade among differing regimes of cost internalization will result in a standards-lowering competition, leading to a situation in which more and more of total world product is produced in countries that do a less and less complete job of counting costs. Hardly a movement toward global efficiency! The current thrust toward economic globalization by free trade, free capital mobility, and free (or at least uncontrolled) migration is in effect the erasure of national boundaries for economic purposes. This greatly undercuts the ability of nations to put into effect any policies in support of sustainable development, including population control and including domestic enforcement of international treaties that may have been signed in support of efforts to combat irreducibly global environmental problems. The power vacuum created by the weakening of national communities will be filled by the transnational corporations, which, in the absence of a world government, will be unconstrained by any community interests.

Further discussion of these issues is contained in Chapters 5, 10, and 11.

Sustainable Development, Science, and Religion

I will end this introductory essay with some reflections on the rather low sense of urgency and level of ethical motivation inspired by sustainable development—in the World Bank, academia, the U.S. government, and most other national governments. Of course there are individual exceptions in each of these domains, prophetic voices that cry in the wilderness. But why do these cries evoke so little response in so much wilderness? What is required to break out of our default position of denial?

Some prominent scientists turned part-time prophets calling for environmental repentance have asked themselves this same question. Some of them have decided that science has the techniques but is unable to ignite sufficient

moral fervor to induce the public to accept and finance policies that apply these techniques. They thought that it would be worth a try to appeal to religion to supply the missing moral fervor as a basis for political consensus. This resulted, in May of 1992, in the "Joint Appeal by Science and Religion on the Environment," led by the eminent scientists Carl Sagan, Edward O. Wilson, and Stephen Jay Gould, along with a few religious leaders, and hosted by then Senator Al Gore. The three scientists are quite well known for their affirmations of scientific materialism and consequent renunciations of any religious interpretation of the cosmos, as well as for their highly informed and genuine concern about the environment. Their rationale for courting the religious community was that while science had the understanding on which to proceed, it lacked the moral inspiration to act and to inspire others to act. Or, in a frequently used metaphor, religion was asked to supply the moral compass, while science would supply the vehicle.

I attended the conference, and was vaguely troubled at the time by what seemed to me a somewhat less than honest appeal by the scientists to a somewhat credulous group of religious leaders. A year or so later I read a book by theologian John F. Haught, who had also been present, and discovered that he had precisely articulated my vague doubts.

In *The Promise of Nature*, Haught wondered aloud

whether it is completely honest for them [the scientists] to drink in this case so lustily from the stream of moral fervor that flows from what they have consistently taken to be the inappropriate and even false consciousness of religious believers. . . . The well-intended effort by the skeptics to co-opt the moral enthusiasm of the religious for the sake of ecology is especially puzzling, in view of the fact that it is only because believers take their religious symbols and ideas to be disclosive of the *truth* of reality that they are aroused to moral passion in the first place. If devotees thought that their religions were *not* representative of the way things *really* are, then the religions would be ethically impotent. . . .

It is hard to imagine how any thorough transformation of the habits of humans will occur without a corporate human confidence in the ultimate worthwhileness of our moral endeavors. And without a deep trust in reality itself, ecological morality will, I am afraid, ultimately languish and die. Such trust . . . must be grounded in a conviction that the universe carries a meaning, or that it is the unfolding of a "promise". A commonly held sense that the cosmos is a significant process, that it unfolds something analogous to what we humans call "purpose", is, I think an essential prerequisite of sustained global and intergenerational commitment to the earth's well-being.¹¹

Haught's point, of course, is that Sagan, Wilson, and Gould proclaim the cosmology of scientific materialism, which considers the cosmos an absurd accident, and life within it to be no more than another accident ultimately reducible to dead matter in motion. In their view there is no such thing as value in any objective sense, or purpose, beyond short-term survival and reproduction, which are purely instinctual and thus ultimately mechanical. Calling for a moral compass in such a world is as absurd as calling for a magnetic compass in a world in which you proclaim that there is no such thing as magnetic north. A sensitive compass needle is worthless if there is no external lure toward which it is pulled. A morally sensitive person in a world in which there is no lure of objective value to pull and persuade this sensitized person toward itself is like the compass needle with no external magnetic force to act on it.

One might reply that objective value does not exist externally, but is an internal affair created by humans (or by God in humans only) and projected or imposed by humans on the external world. This is the solution of dualism, and has been dominant since Descartes. Purpose, mind, and value enter the world discontinuously in human beings; all the rest is mechanism. Such a view, however, is contrary to the evolutionary understanding of kinship of human beings with other forms of life that is affirmed by science. For mind, value, and purpose to be real, they must, in an evolutionary perspective, already be present to some degree in the world out of which humans evolved, or else they must be the object of a special creation. The latter, of course, is not acceptable to science and the theory of evolution. Scientific materialism resolves the dilemma by denying the reality of purpose, mind, and value in human beings as well as in the external world. The subjective feelings that we refer to as purpose or value are mere epiphenomena, ultimately explainable in terms of underlying physical structures and motions.

The main alternative to scientific materialism, one that still takes science seriously, is the process philosophy of Alfred North Whitehead. This view is radically empirical. What we know most concretely and directly, unmediated by the senses or by abstract concepts, is our inner experience of purpose. That should be the starting point, the most well known thing, in terms of which we try to explain less well known things. To begin with highly abstract concepts such as electrons and photons, and to explain the immediate experience of purpose as an "epiphenomenon" incidentally produced by the behavior of these abstractions, is an example of what Whitehead called "the fallacy of misplaced concreteness." I do not wish to pretend that Whiteheadian philosophy is easy, or without problems of its own, but merely to say that for me it strains credulity a lot less than scientific materialism.

Gould himself has noted, "We cannot win this battle to save species and environments without forging an emotional bond between ourselves and nature as well—for we will not fight to save what we do not love."¹² But is it possible to love an accident? Rather, is it possible for an accident to love an accident? For an

accident to fight to save another accident? I doubt it, but I do not doubt that it is possible for people who call themselves scientific materialists to fall in love with the world they study and have come to know intimately. God's world is lovable, and scientists often fall in love with it much more deeply than theologians! But should they not confess that love, and ask themselves how it is that they could have fallen in love with something their science tells them is an accident? In their daily life are they particularly fond of random events, or do they find them annoying? There is something fundamentally silly about biologists teaching on Monday, Wednesday, and Friday that everything, including our sense of value and reason, is a mechanical product only of genetic chance and environmental necessity, with no purpose whatsoever, and then on Tuesday and Thursday trying to convince the public that they should love some accidental piece of this meaningless puzzle enough to fight and sacrifice to save it.

The absurdity is highlighted by the scientists' recognition that they have nothing to appeal to in their effort to rouse public support other than religiously based values that they themselves consider unfounded! Are they not temporarily living by the fruit of the tree whose taproot they have just cut? As Haught puts it,

Such thinkers consider any vision of purpose in the universe to be archaic and illusory. . . . Indeed it is rare to find scientists, literati or philosophers publicly claiming that our universe has any point to it or that any transcendent purpose influences its evolution. But can this cosmic pessimism adequately nourish the vigorous environmental activism that many of these same thinkers, now hand in hand with members of the religious community, are calling for today?¹³

To call this a "quite ingenuous proposal," as Haught does, is to be kind. It also should be surprising (and flattering beyond merit) to members of the religious community that the scientists should assume that the majority of today's religious people will in fact be led by their beliefs to care about the environment, when to date that has not happened. It is indeed a paradox that people whose professed beliefs give them no good reason to be environmentalists are usually trying harder to save the environment than are people whose beliefs give them every good reason to be environmentalists! The scientists are implicitly calling for a religious reformation, not just a moral compass that magically functions in an amoral universe—to point the scientists in the direction of public funds to save the environment.

As Alfred North Whitehead observed,

Many a scientist has patiently designed experiments for the purpose of substantiating his belief that animal operations are motivated by

no purposes. He has perhaps spent his spare time writing articles to prove that human beings are as other animals so that purpose is a category irrelevant for the explanation of their bodily activities, his own activities included. Scientists animated by the purpose of proving that they are purposeless constitute an interesting subject for study.¹⁴

We might add that religious persons animated by a belief in the Creator God, yet happily participating in the destruction of Creation, also constitute an interesting subject for study.

During the meeting in Washington, D.C., of the Joint Appeal, the void of purpose was frequently glossed over in discussions with the phrase “for our children.” But of course if we are accidents then so are they, and the dilemma is not resolved by pushing it one generation forward. I recall that one woman was evidently so annoyed by the sentimentality of this constant and cloying invocation of “our children” that she took the microphone to say that she had no children, and was she to understand, therefore, that she had no reason to care about the future of God’s Creation? I believe the woman was a reporter or photographer, not even an official participant, but I thought her intervention was on target. To read some biologists you would think that whoever does not manage to propel their genes into the next generation might as well never have lived!

Environmentalists and advocates of sustainable development really must face up to deep philosophical and religious questions about why their efforts ultimately make sense. Neither vague pantheistic sentimentality about Gaia, nor the ad hoc wishful invention of instincts like “biophilia” can withstand much philosophical criticism. But they are welcome first steps away from pure scientific materialism. I find the thinking of a minority of Christian thinkers influenced by Whitehead, such as John B. Cobb, Jr., John F. Haught, and Charles Birch, to offer a much more solid base than either scientific materialism or traditional theology for loving nature enough to fight to save it. Many other traditional religions share with Christianity a theology of Creation (not the same as the literalist sect doctrine of “scientific creationism”), so the theological basis for something like “biophilia” as a persuasive virtue rather than a mechanical instinct is widely affirmed. All traditional religions are enemies of the same modern idolatry—that accidental man, through economic growth based on science and technology, is the true creator, and that the natural world is just a pile of instrumental, accidental stuff to be used up in the arbitrary projects of one purposeless species. If we cannot assert a more coherent cosmology than that, then we might as well close the store and all go fishing—at least while the fish last.

For the above reasons I felt that it was absolutely necessary to include Part 7, on religion and ethics, in this book, in addition to the other more usual sections on economic theory, operational policy, national accounts, population, in-

ternational trade, and the recent history of economic thought on sustainability. I put this topic last not because I think it least important—I think it is most important—but because I am least qualified to deal with it, and because in our society, where political correctness has come to include an antireligious attitude, it will likely be the most controversial part. As a strategy of building consensus it is probably good to keep the most controversial issues for last, even if they are ultimately the most important. But it would be quite dishonest not to bring them up at all.

Chapter 15

Sustainable Development: From Religious Insight to Ethical Principle to Public Policy

To go from religious or spiritual insight to the concrete economic policies most in conformity with that insight is a big jump. We need an intermediate step: the formulation of ethical principles—general principles of right action in the world. Then we can ask what concrete economic policies in our specific historical context best serve these ethical principles, and thus indirectly serve the insight from which these principles were derived.

Errors can of course be made at each of the three steps. Our religious insight might be wrong, perhaps too insensitive, or perhaps too fanatical. The translation of a basic religious insight into an ethical principle may be historically biased or too one-sided, even if the basic insight is true. The derivation of specific economic policies from a general principle of right action in the world could be mistaken. Even when our ethical principle is sound, our faulty understanding of how the world works sometimes leads to policies that have effects opposite from those we desired.

The Religious Foundations of Sustainable Development

Although I will draw mainly on Christian traditions in speaking of religious foundations, it is my belief that most other religious traditions give similar insights regarding Creation and stewardship. (This is to be expected for Judaism and Islam, which share early biblical roots with Christianity.) Buddhism, for example, teaches moderation and the virtue of living lightly on the world. I focus on Christianity because I am a Christian, not out of any exclusivist wish to deny the truth of other traditions. I find it enormously encouraging that there is so much agreement among traditional religions on the issue of stewardship. It is less encouraging that we all share a com-

mon need for repentance for our various failures to take stewardship seriously in practice.

We are taught that God created the world and all therein. In the Genesis story, Creation was declared good by God even before Adam and Eve were created, and Creation was pronounced *very* good after human beings were added. Man is special, but not the only creature valued by the Creator. The world and our lives within it are the gifts of God, for which we should be grateful. Our gratitude and thanksgiving are expressed in worship, but should also be expressed in restraint. If we love God we will love God's world. If we are grateful for God's gift of life we will not waste the capacity of God's world to support life. If we love God's world we will try to understand how it works, so that we will not ignorantly harm it, like a curious child playing with a grasshopper. We will learn self-control before presuming to control Creation—taking seriously the Buddhist meditation "Cut down the forest of your greed, before cutting real trees."

Not only humans matter, although we matter most. A person is worth many sparrows, but for that statement to mean anything a sparrow's worth cannot be zero. All living things have both instrumental value for other living things and intrinsic value by virtue of their own sentience and capacity to enjoy their own lives. We customarily value subhuman species in terms of their instrumental value to us, neglecting both their intrinsic value and their instrumental value to other subhuman species. We grant ourselves intrinsic value, as well as instrumental value to each other (often the source of conflict). But we do not count our instrumental value to other species, which is too often negative but could be positive if we cared about it. Even a first cataloging of types of value in the world leads to an environmentalist insight.

There are heresies in Christianity that tend to despise the world (Manicheanism, Gnosticism), and despising the world is indeed a heresy for a religion that teaches not only that God created the world, but also that God was and is incarnate in that world. Is the church in the grip of such a heresy today? Is that what explains its slowness to speak out on issues of environmental protection? I do not think so. Rather, I believe, it is the failure of the church to understand that Creation really is under severe threat.

It is difficult to see this, not only for Christians but for many people of goodwill, because the threat comes from growth (both demographic and economic), and growth is something long considered benign. Growth was supposed to spread the benefits of abundant life to all. It promised to cure poverty and misery without demanding too much in the way of sharing. Technological solutions to poverty would succeed in the future where moral solutions had failed in the past. This was the hope of the Enlightenment and the modern scientific establishment, including especially its Marxist heresy of recent demise. Christianity was in agreement with secular culture for a change, and that was comforting—a bit too comforting, in retrospect.

Exponential growth has taken us, in a surprisingly short time, as I have argued, from a relatively empty world to a relatively full world—full of people and their furniture. Economic growth made the world full of us and our things, but relatively empty of what had been there before—that which now has been assimilated into us and our things, namely, the natural life-support systems that we have recently started calling “natural capital” out of belated recognition of both their utility and their scarcity. Further expansion of the human niche now frequently increases environmental costs faster than it increases production benefits, thus ushering in a new era of antieconomic growth, growth that impoverishes rather than enriches because it costs more at the margin than it is worth. This antieconomic growth makes it harder, not easier, to cure poverty and protect the biosphere. GNP continues to grow while the welfare of the people declines. Out of confusion, or perhaps out of idolatry, we continue to mistake the symbol for the reality symbolized. Even after the symbol has become a gross misrepresentation of reality we continue to serve it.

The religious insight here affirmed, namely that this is God’s world and we are responsible for how we treat it, is so elementary that it is hard to say more about it. One clarification needs emphasis—in speaking of Creation I am not implying acceptance of the antievolutionist, biblically literalist doctrine that has come to be called “scientific creationism.” God’s creation of a creative evolutionary process is, to me at least, even more awesome than would be the creation of a world of static forms of life. Nor in making this clarification do I wish to endorse the imaginative “just-so stories” and circular speculations concocted by the dogmatic Darwinists who have made themselves irrelevant to issues of ethics and policy by their mechanistic denial of the reality and efficacy of purpose itself, as discussed in this book’s introductory essay. A. N. Whitehead’s remark is worth repeating: “scientists animated by the purpose of proving that they are purposeless constitute an interesting subject for study.”

Just how God created the world is an important question closely related to understanding how the world works, a question we must take seriously if we are to avoid damaging that creation through ignorance. But this question comes later. The prior issue is our acceptance of God’s gift of the living world and our obligation to care for it. This obligation exists regardless of the particular divine technology or blueprint with which God made the world, and regardless of the present state of our understanding of how randomness and purpose interact in the divine technology. Of course the obligation to care for the created world would not exist if randomness explains everything and purpose is declared a mere hallucination—if intentionality is not causative then we need not be concerned with ethics.

There is a further insight, however, that is very important. Although it is not necessarily a religious insight, it nevertheless may come easier to people who see themselves more as creatures than as creators. This is the preanalytic vision—elaborated in the book’s introduction and in Part I—that sees the economy

as an open subsystem of a larger but finite, non-growing, and closed ecosystem on which it is fully dependent for sources of low-entropy raw materials and for sinks to absorb high-entropy waste materials. Completely nonreligious people may hold this vision simply because it conforms to the facts of experience. The alternative preanalytic vision, the one that supports most economic analysis today, is that the economy is the total system and is unconstrained in its growth by anything. This vision concedes that nature may be finite, but sees it as just a sector of the economy, for which other sectors can substitute without limiting overall growth in any important way. The latter vision somehow fits with the idea that human beings are fundamentally creators rather than creatures. I hesitate to call these visions religious insights. But preanalytic visions share with religious ones the feature that ensures that we can never escape them by analysis: they define the terms of analysis and therefore cannot provide us with a perspective that could refute their own viewpoints. Their hold on us is in part one of faith and commitment. The vision of economy as subsystem is not the same as the fundamental religious insight that the world is God’s Creation, and that we and all our little creations are part of and limited by that larger creation, but it is certainly more in harmony with that insight than the vision of man’s economy as the total system with nature a subsector whose services can be substituted by other sectors. The analytical consequences of these two preanalytic visions are, as I have argued, enormously different: the economy-as-subsystem vision leads to the quest for an optimal scale of the human niche, beyond which growth should cease; the economy-as-total-system vision leads to growth forever as the norm.

The Ethical Principle of Sustainable Development

If we accept the religious insight that the world is God’s Creation, and are able to discern that we too are creatures of God with creaturely limits on our own creativity, then what conclusions should we draw about how to act rightly in the world? Should we convert as much as possible of the matter/energy of the world into ourselves and our artifacts? Should that be the “central organizing principle” of society, to use Vice President Gore’s term? Indeed, growth has been and still is our central organizing principle. That is precisely our problem. We need a new central organizing principle—a fundamental ethic that will guide our actions in a way more in harmony with both basic religious insight and the scientifically verifiable limits of the natural world. This ethic is suggested by the terms “sustainability,” “sufficiency,” “equity,” “efficiency.” Growth has become unsustainable. It has never been equitable in that some live far above sufficiency, while others live far below. And no system that uses resources at a rate that destroys natural life-support systems without meeting the basic needs of all can possibly be considered efficient.

To capture the cluster of values expressed by “sustainability/sufficiency/equity/efficiency” in one sentence, I suggest the following: *We should strive for sufficient per capita wealth—efficiently maintained and allocated, and equitably distributed—for the maximum number of people that can be sustained over time under these conditions.*

Some clarifications are needed. Note that the goal is *sufficient*, not maximum, per capita wealth. Sufficient for what? Sufficient for a good life. I will not try to define “good life,” but I will note that not only man-made wealth but also preserved natural capital is necessary for a good life. What is maximized is cumulative number of lives over time lived in sufficiency. This is very different from maximizing the population simultaneously alive. Too many people alive at one time overloads and destroys the earth’s carrying capacity, resulting in fewer lives, or lives lived below sufficiency, in subsequent time periods, and consequently a smaller cumulative total of lives lived in a condition of sufficiency. Too much consumption per capita at any one time leads to the same result. The value of efficiency, both technical and allocative, is affirmed because it allows more people to exist over time in conditions of sufficiency. Wealth “efficiently maintained” means that wealth as it depreciates is replaced by new production that gives greater (maximum) use or satisfaction per unit of resource used. Equitable distribution means that sufficiency is attained by all, and that the range of inequality above sufficiency is limited. It does not mean equal wealth for all. Some degree of inequality of wealth is necessary for justice, efficiency, and community. But, as discussed in the previous chapter, the present range of inequality is vastly greater than what is consistent with community or necessary for economic incentive. The idea of sustainability, of course, is captured by the insistence on maximizing cumulative lives *over time*.

Since utilitarianism is the basic ethic underlying economics, it is useful to compare the above statement with Jeremy Bentham’s utilitarian guide of “the greatest good for the greatest number.” Bentham’s rule has the virtue of brevity, but unfortunately it contains an impossible double maximization. You cannot have two “greatests” because it is possible to have either more people at a lower per capita good or greater per capita good for fewer people. Logically it would have to be either “greatest good for a sufficient number” or “sufficient good for the greatest number.” The principle here advocated is the latter, with “number” defined as cumulative number over time.

The reason for that choice is that we have no notion of what is a sufficient number over time—that would imply deciding when the world should end. Standard economics, however, by its practice of discounting the future, is implicitly willing to say that beyond some point the future is worth nil and might as well end. Rejection of this view is part of the thrust of the concept of sustainability. Although both Christianity and thermodynamics teach that the world is not perpetual, we nevertheless affirm that life and longevity are good gifts of God and should not be

wasted. Also, we do have some notion of how much is sufficient for a good life, even though there will be disagreement. Much thought and clarification is needed here, but, clearly, at one extreme life can be stunted by poverty, and just as clearly, at the other extreme life is not improved and is even harmed by surfeit and excess. It is not too much to expect that we could come up with a reasonable range of inequality limits, notwithstanding the chorus of econo-sophists who will ask, Who are *you* to impose your personal tastes on everyone else? etc., etc., ad nauseam. If the cluster of values affirmed above were logically reducible to “personal tastes,” and if continual growth were biophysically possible, then this common objection would have force. The fact that both presuppositions of this objection are clearly wrong is indicative of the low level of argument that is customary in what currently passes for serious economic discourse.

The product of population and per capita resource use at any point in time represents the *scale* of the human presence in the biosphere—the rate of total resource throughput. It is this total scale that is limited by the regenerative and absorptive capacities of the ecosystem, and that is sustainable or unsustainable. For a given sustainable scale of throughput we could choose to have many people consuming small amounts of resources per capital, or fewer people consuming correspondingly more resources per capita. This is the choice of “sufficient good,” subject to which cumulative lives would be maximized.¹

If something like the ethic offered above is accepted, then we will have to find economic policies for putting it into practice. Without such an ethic we will be led astray by sophists who argue that we have no obligations to the future because future people do not exist, and rights cannot inhere in nonexistent people, and without rights there can be no obligations. Therefore we have no obligations to future people. And even if we did, it is sometimes added, the best way to serve the future is to maximize present riches. The invisible hand, it is argued, not only converts personal greed into social benevolence, it also transforms generational selfishness into intergenerational generosity. The bequest to the future of man-made capital is thought to more than compensate for the depreciation and liquidation of natural capital.

But the value of a sawmill is zero without forests; the value of fishing boats is zero without fish; the value of refineries is zero without remaining deposits of petroleum; the value of dams is zero without rivers and catchment areas with sufficient forest cover to prevent erosion and siltation of the lake behind the dam. Empty verbiage about the intergenerational invisible hand and the near-perfect sustainability of man-made for natural capital is just the usual confused attempt to give a technical nonanswer to a moral question.

I believe that God the Creator exists now, as well as in the past and future, and is the source of our obligation to Creation, including other creatures, and especially including members of our own species who are suffering. Our ability and inclination to enrich the present at the expense of the future, and of other spe-

cies, is as real and as sinful as our tendency to further enrich the wealthy at the expense of the poor. To hand back to God the gift of Creation in a degraded state capable of supporting less life, less abundantly, and for a shorter future, is surely a sin. If it is a sin to kill and to steal, then surely it is a sin to destroy carrying capacity—the capacity of the earth to support life now and in the future. Sometimes we find ourselves in an impasse in which sins are unavoidable. We may sometimes have to sacrifice future life in order to preserve present life—but to sacrifice future life to protect present luxury and extravagance is a very different matter.

Many will share the sense of obligation for Creation affirmed in the preceding paragraph but will recoil from grounding it in theism of any kind. One has a right to expect, however, that they will make an effort to ground their sense of obligation in something more basic than their own subjective personal preferences—even if (especially if) the latter are thought to be mechanically derived from a process of random genetic mutation and natural selection. In particular, one has a right to expect sufficient discernment and clarity on their part to avoid mistaking a vestigial sense of obligation, inherited from an age of theistic belief, for a new sense of obligation presumably derived from the modern cosmology of scientific materialism.

Economic Policies for Sustainable Development

Economic policy for sustainable development must no longer seek solutions to economic problems in terms of the modern central organizing principle of growth, but in terms of the traditional principles of sustainability, sufficiency, equity, and efficiency.

The first step in this change is to recognize, as I have argued in Chapter 2, that there are three economic problems—allocation, distribution, and scale. These three economic problems represent separate goals—and solving one does not solve the others. Today we are trying to kill three birds with two stones. The first goal is the problem of allocation, the division of the resources among their alternative commodity uses—that is, how many resources to allocate for cars, for bicycles, for shoes, for beans. An optimal allocation is one that is efficient in giving people what they want and are able to pay for. The instrument for attaining efficiency is relative prices, which measure marginal opportunity costs. The second goal is distribution, the division of the resources in their final product embodiments among alternative people—that is, how many bicycles or beans are distributed to you, to me, and to other people. An optimal distribution is one that is within the bounds of equity and sufficiency. The policy instrument is transfer payments and limits to inequality. Economic theory has long recognized these two problems, even though the efficiency problem has received far more attention than the equity problem. The scale problem has not traditionally been recognized by economic

theory or policy—it is the newly recognized third goal for which we have no policy instrument.

But today the problem of optimal scale can no longer be avoided. It was avoided in the past because as long as scale was small it was possible for economic growth to be a central organizing principle of society. Growth was put in first place because it would presumably wash away the problem of poverty in a cascade of abundance vouchsafed by the amazing grace of compound interest. There would be no need for redistribution; indeed, premature redistribution would only slow the growth machine. Growth would also wash away inefficiency without the political discipline of getting relative prices to reflect full social and environmental costs. But scale too has its limits. It has a maximum, and well before the maximum it has an optimum—a point beyond which further growth costs more than it is worth. Evidence increases daily that we have passed that optimum scale.

The existence of such an optimal scale follows closely from the pre-analytic vision of the economy as an open subsystem of a larger but finite and non-growing ecosystem. As the economy expands physically, it assimilates into itself an ever greater proportion of the total life space and the total matter/energy of the ecosystem. Less is therefore available to all other species to provide the services we depend upon, such as photosynthesis, to mention only the most important. At some point well before the boundaries of the growing subsystem coincide with the total system, we will have sacrificed life-support services that are far more valuable than the extra commodity services that we got in return.

Since the earth itself is developing without growing, it follows that a subsystem of the earth must eventually conform itself to the same behavioral mode of development without growth, alias “sustainable development.” This could happen at any scale which is below carrying capacity. The optimal scale, following our basic ethic, would be the one that maximizes lives ever lived over time at a sufficient level of per capita resource use for a good life. At present all we know for sure is that the optimal scale must be sustainable, that the economic subsystem must not overload the ecosystem to the point of reducing future life. For now it is a sufficient challenge to strive for a sustainable scale. Later we can worry about which sustainable scale is optimal.

The notion of optimal scale in the preceding paragraph is totally anthropocentric in that the human niche is constrained only by the necessity to preserve other forms of life for their instrumental value to us—that is, their ecological life-support service. No intrinsic value of other species was recognized. If we do recognize the intrinsic value of other living things—as Scripture does and as I think we should—that will give an additional reason for setting aside life space, or habitat, for them, and would result in a smaller optimal scale for humans than if the instrumental value of other creatures is counted.²

In terms of specific economic theory, the paradigm policy for solving the allocation, distribution, and scale problems seems to me to be the tradable per-

mits plan, as discussed in Chapter 2. The great virtue of the tradable permits scheme is that it forces us to distinguish three independent policy goals and to recognize that they require three independent policy instruments. Moreover, it also requires that the first two goals (scale and distribution) be decided socially before the third (allocation) can be worked out individualistically by the competitive market.

Summary and Conclusion

We are creatures endowed with creativity but also subject to limits, and we have obligations to our Creator to care for Creation, to maintain intact its capacity to support life and wealth. Specifically this means to act so as to maximize cumulative lives ever to be lived over time in a state of sufficiency. This in turn means not destroying carrying capacity—which implies that sustainability, not growth, should become the ruling ethic for a Creation-centered economy. In this vision, along with sustainability, the associated values of sufficiency, equity, and efficiency become the central organizing principles of the economy. Growth in population or per capita resource use would be encouraged or discouraged according to their favorable or unfavorable effects on sustainability, sufficiency, equity, and efficiency. The type of concrete policy for best doing this, I have argued in Chapter 2 and elsewhere, is the tradable permits scheme which forces a clear separation of scale, distribution, and allocation.

The technical and economic problems involved in achieving sustainability are not that difficult. The hard problem is overcoming our addiction to growth as the favored way to assert our creative power, and the idolatrous belief—whether we think in religious terms or not—that our derived creative power is autonomous and unlimited. Such idolatry cannot admit that the elimination of poverty requires recognition of *limits*, not faster growth—*limits* to growth in per capita resource use, *limits* to population growth, *limits* to the growth of inequality. Refusal to recognize these creaturely limits results in growth beyond the carrying capacity of the earth, with its consequent destruction, followed by a reduction in cumulative number of lives ever to be lived in conditions of material sufficiency, as well as in the premature deaths of many people now living below sufficiency.

We must face the failures of the growth idolatry. We must stop crying out to the growing economy, "Deliver me, for thou art my god!" Instead, we must have the courage to ask with Isaiah, "Is there not a lie in my right hand?"