

nores the most troubling aspect of the case—namely, the historical contributions of the industrialized world to the present buildup of greenhouse gas.

As we have already argued, any attempt to assess past contributions to the problem must factor in the benefits that resulted from the laissez-faire regime. But since those benefits are so widely diffused and difficult to quantify, the quest for a reliable measure of cumulative liability seems hopeless. A better solution, suggested by the Montreal accord, would be for industrialized countries to establish a joint fund that would invest in research and technology transfer and financial aid to help developing countries adjust to the new regime.

Even relatively modest levels of investment could produce substantial benefits. For example, the fund could support the development of improved world climate models, as well as basic research into the chemical and biological processes related to the greenhouse effect. The fund might also award prizes for inventions and discoveries that could help to remedy global warming. At a more ambitious level, the fund could provide credits to developing countries that adopt technologies expected to reduce greenhouse-gas emissions.

A reasonable basis for sharing the costs of such a fund would be a commonly accepted measure of ability to pay—such as gross domestic product or the United Nations contributions scale. By any such formula, the burden of costs would fall squarely on the developed countries. Not only would this be widely regarded as fair, it could prove of strategic value in generating an agreement. The developed world must make a serious commitment, not only to cutting back its own emissions, but also to helping less developed countries deal with a problem that industrialized countries are largely responsible for creating.

— H.P. Young

H.P. Young is an economist at the University of Maryland's School of Public Affairs and a specialist in issues of distributive justice. His forthcoming book *Equity* examines the ways that public agencies allocate scarce resources and necessary burdens. The sources cited in this article are United Nations Environment Program, *Montreal Protocol on Substances that Deplete the Ozone Layer* (1987); Susan Suback, *Accountability for Climate Change* (Boston: Stockholm Environmental Research Institute, 1990); World Bank, *World Development Report* (Washington, D.C.: World Bank, 1986, 1988); *Information Please Almanac* (Boston: Houghton Mifflin, 1990). The data was compiled by Amanda Wolf.

Greenhouse Economics: Think Before You Count

Most people agree that the greenhouse gases produced by modern society are changing the make-up of the earth's atmosphere. Most people also agree that these changes will cause a rise in average temperatures near the planet's surface. Granted, there continue to be uncertainties about the size and speed of the temperature increase, its implications for human activities, and its ecological effects, all of which have been stumbling blocks to forging an agreement on global warming. But an equally important stumbling block has attracted comparatively little attention: the fact that different decision-making frameworks have been brought to bear on the discussion of what our policies should be.

One of these—the utilitarian market framework (UMF)—attempts to use the conceptual apparatus of welfare economics to assess environmental policy options. A good example of this approach can be found in the writings of William Nordhaus, John Musser Professor of Economics at Yale. In "How Fast Should We Graze the Global Commons?" Nordhaus recommends that alternative strategies for controlling greenhouse-

gas emissions "be weighed by examining their implications for consumption (or real income) of different generations." On this view, how much we would be willing to pay to control emissions "must equate discounted costs and benefits of . . . abatement in terms of consumption." Costs and benefits are discounted back to their present value so that they may be compared with one another. We then choose the strategy that maximizes the benefits over the costs.

The UMF's key assumption is stated explicitly in "To Slow or Not To Slow: The Economics of the Greenhouse Effect." "We assume," Nordhaus writes, "that it is desirable to maximize a social welfare function that is the discounted sum of the utilities of per capita consumption." According to the UMF, we should maximize the benefits of actions taken over the costs of

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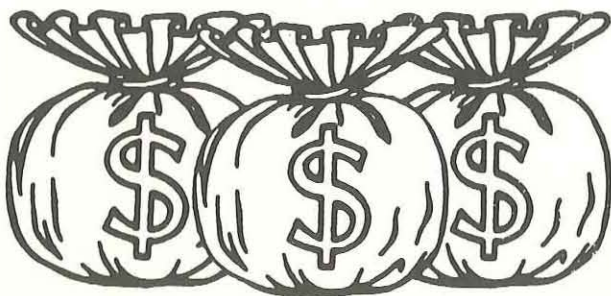
those actions *as measured by the ability to consume*. So if slowing global warming diverts resources that could otherwise be spent on consumer goods, then the resources have been ill spent. On the other hand, if global warming itself will reduce consumption opportunities—for example, by causing problems for agriculture that result in higher food prices—then we should spend money to avert it up to the point where the extra costs equal the benefits derived from them.

The UMF decrees that all costs and benefits be discounted back to the present; that is, the value of future costs and benefits should be weighted to take into account their occurrence in the future. Discounting simply formalizes the common-sense notion that people would rather have a dollar today than a year from now. Accordingly, they will pay less for a dollar a year from now than for the dollar now.

Environmental Values and Inequities

If the UMF isn't *the* standard economic approach, it is at any rate *a* standard economic approach. Yet serious difficulties arise when applying this framework to global warming.

Perhaps the most obvious problem is the assumption that we know what people want, including and especially their trade-offs between environmental values and other goods. Nordhaus cites no data whatsoever about what people actually want with respect to global warming. Of course, one could argue that collecting data is unnecessary because what people want has already been revealed in the market through their purchases. But to make this argument persuasive one would have to show how present markets reveal not only our own preferences about global warming and its effects, but also the preferences of persons yet unborn—a demonstration no one is likely to offer.



As the UMF pays little attention to goods that aren't efficiently priced by the market system, so it pays little attention to distributive issues such as the unequal ability of countries to adapt to climate change. As a rule, technologically advanced countries will be better able to avoid, or at least mitigate, the negative aspects of global warming. The UMF has nothing to say about such inequalities, except indirectly through interdependent utility functions—an avenue Nordhaus does not explore.

It seems inappropriate in the extreme to assess policy options without considering the potential impact of what we do, or fail to do, on those already at the

margins of subsistence. In "Greenhouse Economics: Count Before You Leap," Nordhaus himself notes that "small and poor countries with large agricultural sectors are particularly vulnerable." But a bit later in the same article he suggests that "the best investment today may be learning about climate change rather than preventing it." Should the poor literally sink or swim as the oceans rise?

Discounting the Future

Advocates of the UMF assume that everything should be discounted. In making this assumption they move uncritically from using a tool that is helpful in business decisions, such as trying to estimate the net returns on different investments, to using the same tool for issues of planetary management. There are three serious problems here.

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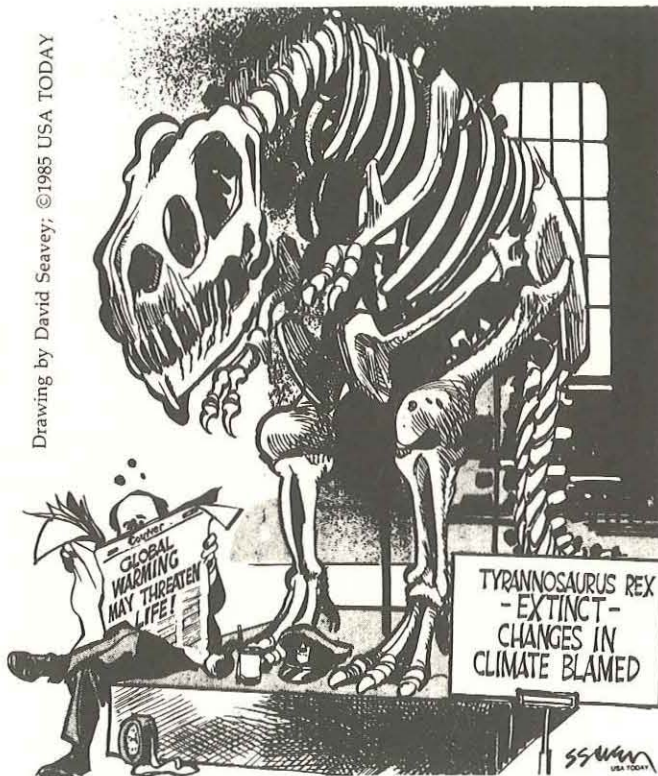
First, there are some things that are not, and should not be, discounted. No one asks, "What is the optimal rate of shredding for the U.S. Constitution?" On the contrary, we assume that we should preserve the historic document for posterity. This is precisely analogous to what many people think we should do with respect to the earth's ecosystems. Of course, economists might reply that these two examples simply show us to have a negative discount rate with respect to these issues; but all this response demonstrates is that the UMF doesn't tell us what the discount rate should be, or even whether there should be one.

Second, even if we assume that there should be a discount rate, appeals to "the discount rate" cover up a number of factors. One of these is opportunity costs, another is uncertainty. Merging the two under one discount rate simply obscures what is at issue. We would reveal what is at stake much more clearly by talking about opportunity costs and uncertainty separately.

Third, in any situation where there is a long-term asymmetry between costs and benefits, as is the case with global warming, discounting imperils the future by undervaluing it. Although the costs of averting the greenhouse effect are paid in the present, the benefits accrue in the distant future. The discounted value of harms that occur a century from now are insignificant when compared with the present costs of avoiding them. As D'Arge, Schulze, and Brookshire argue in "Carbon Dioxide and Intergenerational Choice," "a complete loss of the world's GNP a hundred years from now would be worth about one million dollars today if discounted by the present prime rate."

Fungibility and Rationality

Proponents of the UMF assume that all goods are of the same kind; so we shouldn't bat an eye if we trade off two hundred species for a 1 percent rise in GNP unless somebody manages to show that the species are worth more than the 1 percent in dollar terms. An important purpose of legislation such as the Endangered Species Act is to limit trade-offs of this kind. Many environmental laws such as the U.S. Clean Air Act and workplace safety rules also limit cost-benefit comparisons as the basis of policy. Are all such regulations irrational?



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Maybe they are, at least according to Nordhaus. In "To Slow or Not To Slow" he declares that a model like his "must underpin any rational decision." This claim, however, rests on a confusion about what rationality is. Any definition of instrumental rationality must have two parts: an *end* of some kind, and *means* that are to be conserved in reaching that end. Though maximizing utility is certainly one end, there are many others, such as maximizing liberty, maximizing justice, doing what one's role requires, and so on. In the context of climate change, responsible stewardship of the earth and its ecosystems would seem to be a reasonable end to have in view.

A Perilous Pedigree

The UMF, as presented by Nordhaus, has embraced a doctrine that finds its classical formulation in John Stuart Mill's *Utilitarianism*. According to Mill, utilitarianism "holds that actions are right in proportion as they tend to promote happiness, wrong as they tend

to produce the reverse of happiness." From this it follows that we should seek the greatest happiness for the greatest number.

Although there have been many criticisms of this doctrine in the philosophical literature that has grown up since World War II, the UMF proceeds as if utilitarianism had never been challenged. In addition to the objection about rationality already raised, there are three significant problems with the doctrine:

Because persons, especially in a deeply pluralistic society like our own, have disparate, incommensurable ends, the model of individual decision making cannot simply be recycled for use in collective decision making.

1. Utilitarianism conflates the problem of collective choice with the problem of individual choice. On the utilitarian model of decision making, individuals act to maximize their own happiness. Each of us has a rough, though perhaps only implicit, set of priorities to which we appeal in deciding how our limited resources of time, money, energy, and so on, should be spent so that they'll most increase our happiness. But when we move to the level of social choice, utilitarianism encounters a serious obstacle. Because persons, especially in a deeply pluralistic society like our own, have disparate, incommensurable *ends*, the model of individual decision making cannot simply be recycled for use in collective decision making.

2. Utilitarianism is indifferent to the distribution of utility between parties, just as long as the greatest total utility is attained. Thus utilitarianism has little to say on questions of public policy where the distribution of benefits and burdens is a central issue.

3. Utilitarianism is at once too altruistic and too indifferent to human rights. At least in principle, the doctrine is compatible with severe human rights violations. (We might, for example, return to the institution of slavery if we could thereby achieve a net increase in utility.) On the other hand, utilitarianism requires that we weigh the utilities of others as equal to our own—which means that our personal projects and plans can always be called into question if there is something else we could be doing to increase net utility. In both respects utilitarianism places our personal integrity at risk.

Economists who *are* aware of these problems sometimes try to deal with them by dropping words like "happiness" and "utility" and speaking only about "preferences." In this way they try to discard the baggage of utilitarianism. One variant of this strategy is to assert that there is a *prima facie* case for

giving people what they want—for satisfying their preferences—which means that we should arrange the world so that there can be as much preference satisfaction as possible by allowing all exchanges desired by both parties. But no one really believes this. There are plenty of cases where such exchanges are prohibited, ranging all the way from public offices like the Presidency to the purchase of new cars without seatbelts.

Everything else being equal, it may be better to give people what they want; but until we have said what we mean by “everything else being equal,” we are nowhere.

— Peter G. Brown

Peter G. Brown, director of environmental programs at the University Maryland's School of Public Affairs, is currently working on a book critical of market-oriented approaches to public policy. This article was condensed and adapted from his paper, “Fiduciary Responsibilities and the Greenhouse Effect.” The sources cited are: William D. Nordhaus, “How Fast Should We Graze the Global Commons?” *American Economic Review: Papers and Proceedings*, vol. 72, no. 2 (May 1982); “To Slow or Not To Slow: The Economics of the Greenhouse Effect,” a paper presented to the February 1990 meeting of the American Association for the Advancement of Science; “Greenhouse Economics: Count Before You Leap,” *The Economist* (July 7, 1990); Ralph C. D’Arge, William D. Schulze, and David S. Brookshire, “Carbon Dioxide and Intergenerational Choice,” *AEA Papers and Proceedings* (May 1982); and J.S. Mill, *Utilitarianism*, ed. G. Sher (Indianapolis: Hackett, 1979).

Post-Modernism and the Environmental Crisis

The globalization of the environmental crisis coincides with the crossing of what many consider to be a historic watershed in philosophy. On one side we find the dominant tradition of Western thought, with all its efforts to place human knowledge on a solid, unchanging foundation. On the other side we find certain skeptical, or anti-foundationalist, modes of thinking variously labeled “post-modern,” “post-structuralist,” or “deconstructionist.” Whether or not the emergence of these viewpoints truly constitutes a watershed, and whether or not they actually represent a common tendency of thought, the fact is that many intellectuals have recently adopted an attitude of radical skepticism toward the basic premises of scientific rationalism. Perhaps the most important of these premises has been that human beings can gain access to a stable, context-free foundation for knowledge, and so arrive at a univocal, objective truth.

This widespread skepticism about the foundations of knowledge leads naturally to a rejection of “essentialism”—that is, the belief that our language provides access to immutable essences, or meanings, located in a reality beyond, and hence independent of, the language itself. Defenders of essences are now rare indeed. We find instead a pervasive historicism, acutely sensitive to the unstable, contingent nature of language, and convinced of the historical and societal genesis of all our ideas and practices, including the language or discourses by which they are defined.

Terms such as “nature,” “technology,” “science,” and “environment”—which might be thought to represent constituent properties of an independently existing reality—are seen from a post-modernist perspective as contingent products of historical processes. Like all our words and concepts, they are taken to be “socially constructed.” So, far from having a univocal meaning, the import of each term is thought to vary according to historical, social, and cultural cir-

