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Are We Cheating Our Children?

To make its research readily available to a broad audience, the Center for Philosophy and Public Policy publishes a quarterly newsletter: *QQ—Report from the Center for Philosophy and Public Policy*. Named after the abbreviation for "questions," *QQ* summarizes and supplements Center books and working papers and features other selected work on public policy questions. Articles in *QQ* are intended to advance philosophically informed debate on current policy choices; the views presented are not necessarily those of the Center or its sponsors.

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In this issue:

Life in any form that we can imagine depends on energy, and life as we know it depends on an enormous amount of energy. Our highly industrial, technological, consumer-oriented civilization requires vast quantities of fuel to warm and cool us, feed and clothe us, drive our engines and power our factories. The world's energy use has been increasing exponentially, with little sign of any imminent slackening; the last few generations have burned more fossil fuels than all previous generations combined. Even as the major industrial powers begin to question the desirability and possibility of limitless growth, Third World nations are hastening to build their own industrial plants and correspondingly accelerate their consumption of energy.

For how many more generations can this rate of energy use be sustained? Each generation cannot blithely burn more energy than the last and expect the generations that follow to be able to do the same. Viewed from a long-term perspective, the supplies of the most heavily relied upon fuels are literally running out; renewable sources of energy pose risks we are not yet able to predict or control, or have yet to be shown to be practicable for meeting the seemingly boundless energy needs of the contemporary world. Virtually all experts agree that supplies will continue to dwindle and risks will continue to mount, although there is far less consensus on workable alternative strategies.

Virtually everyone also agrees that it is wrong for the current generation to deplete exhaustible resources and produce inexhaustible hazards, bequeathing a future rich only in risk. Though philosophers debate the source and grounds of our obligations to future genera-

tions, few doubt the existence of the obligations themselves. Whether we explain them as obligations to respect the rights of future persons, or to maximize human happiness, or to produce a better world, the obligations limit our current range of energy choices, perhaps quite severely. No one takes seriously the view that the universe is ours, to plunder and despoil as we will.

But what exactly is the scope of our obligations to future generations? What is it that we owe them? For any use of nonrenewable resources involves leaving an irreversibly diminished inheritance, yet surely we are not obligated to forgo their use altogether. Nor is it possible to live contemporary life without passing on to our descendants certain long-lasting risks. The future, furthermore, is in many respects unknown and perhaps even unknowable. What can we owe to those who may live unimaginably different lives in an unimaginably altered world? The answers to these questions constrain our current choices of alternative energy policies.

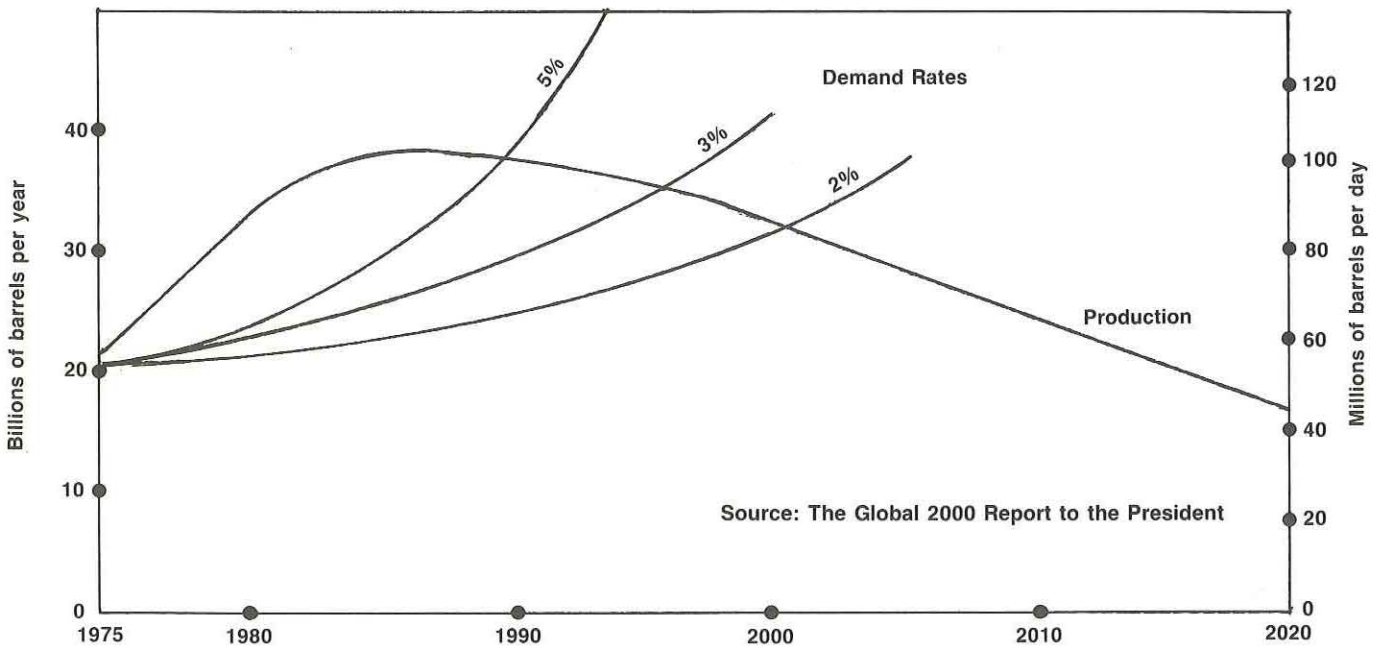
Supply and Opportunity

Two-thirds of the energy used in the world today draws upon the resources whose future supplies are most uncertain: oil and natural gas. David Bodde, Assistant Director for Natural Resources and Commerce in the Congressional Budget Office, estimates that "world oil use [in 1980 was] about 64 billion barrels per day . . . which would suggest a seventy-year supply," given ultimate world oil resources "in the neighborhood of 1600 billion barrels." The outlook for natural gas is less certain, but no more optimistic. Bodde warns, "The transition away from oil and gas must certainly be completed within 100 years, and probably much sooner." The central question for designing a long-term energy policy is to determine how we will make this transition and who will pay the costs.

For our own generation, the question is not whether we should stop depleting the nonrenewable energy stock, since we could not abandon all use of these fuels, nor does justice require this of us. Earth's current inhabitants have rights, too, and if future generations can lay claim to a share of resources, so do we have our share. But what *is* our share, and how should we proceed, in fairness both to ourselves and to our heirs?

Philosopher Brian Barry argues that all generations have an *equal* claim on natural resources: "From an atemporal perspective, no one generation has a better or worse claim than any other to enjoy the earth's resources. In the absence of any powerful argument to the contrary, there would seem to be a strong presumption in favor of arranging things so that, as far as possible, each generation faces the same range of opportunities with respect to natural resources."

Natural resources are valuable, however, only given technology and capital adequate to convert them into usable energy, and so each generation's share of resources must be determined in a fuller context. This means that our legacy to our descendants must include not only a decent share of the resources themselves, but a decent share of the technology and capital that make them valuable. For just as the present generation has no special claim to the resources, so it has no special claim to any but the incremental capital and technology it has contributed to its own vast in-



World maximum oil production at a medium depletion rate and world demand at three growth rates

heritance. As Barry points out, "Most of the technology and the capital stock embodying it are not by any stretch of the imagination the sole creation of the present generation; we cannot therefore claim exclusive credit for it." Even if the current generation cannot avoid depleting the world's stock of resources, it can—and ought to—avoid depleting its inherited stock of capital and technology.

Indeed, we can—and ought to—enhance and increase the stock of capital and technology we pass on, for in this way we can compensate to some degree for unavoidable resource depletion. This idea of compensation provides the cornerstone of intergenerational distributive justice. Thus Barry proposes: "Future generations are owed compensation in other ways for our reducing their access to easily extracted and conveniently located natural resources. In practice, this entails that the combination of improved technology and increased capital investment should be such as to offset the effects of depletion." David A.J. Richards, Professor of Law at New York University, offers a similar proposal: depletion of nonrenewable resources can be compensated if "concurrent with that depletion, a technology has been developed that will meet the depletion and make available to later generations . . . a technology that can secure from depleted resources at least as much (for example, energy) as would have been secured by the original resource." Barry's and Richards's proposals provide a minimal standard of just resource allocation across generations.

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Two questions arise:

1) What if future generations have tastes and habits sufficiently different from ours, or develop sufficiently altered lifestyles or cultures, so that the resources we conserve for them don't give them the kinds of happiness or satisfaction they give us? For in some sense it isn't the resources themselves that matter, nor even the energy they can be converted to, but how the quality of human life is enhanced by their use. What matters, on this view, is not what productive opportunities we bequeath our descendants, but how much utility they derive from those opportunities, and it is equality of utility for which we should strive.

But, in practice, Barry argues, it is enormously difficult to determine how individual persons "convert the means of happiness into happiness itself," and so these kinds of differences should be disregarded in determining public policy. Economist Talbot Page also opposes second-guessing the future in this way: "It seems sensible to focus on and limit our responsibility to what we can foresee and control. With some effort we can control the form of the heritage to be passed on to the next generation. It is beyond the control of the present generation to ensure that the next one will be happy or hard-working. . . . we can only assure them of certain opportunities for happiness that we foresee will be essential."

Barry maintains, moreover, that even if the practical difficulties of predicting future happiness were not insuperable, justice simply does not require equal distribution of utilities. "Justice consists in [everyone's] getting an equal crack at society's resources," not in everyone's getting the same measure of happiness from those resources. "We should not hold ourselves responsible for the satisfaction [future generations] derive from their opportunities." The opportunities are our concern; the satisfaction, theirs.

2) But what if the world changes in such a way that the resources we carefully conserve and pass on no longer provide a viable source of productive opportunity? Page calls attention to the possibility that "a great deal of effort and sacrifice could be spent preserving some part of the resource base that no one in the future might want."

Although our radical ignorance about the future keeps this possibility in view, Page suggests that it can be all but dismissed for "essential goods—conditions of basic health, alternative provision of energy sources, water, soil, space per capita, etc." It is extremely unlikely that such goods would ever be preserved for naught. And, "as an empirical matter, it appears that dependence on the physical resource base is growing, not shrinking." We may risk inefficiency by saving for our children, but by not saving we risk injustice. If we can avoid one only at the cost of the other—which is not at all certain—perhaps it is better to err on the side of behaving justly toward those who come after us.

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What, then, does distributive justice across generations require of us? We should progress on the transition from nonrenewable to renewable resources and develop technology to make our nonrenewables go further. But those renewable resources that are currently best developed to meet our burgeoning fuel needs also carry with them the greatest intergenerational risks, and new technologies to extend the nonrenewables may create risks of their own. Supply and risk are in some cases traded off against each other: oil and

natural gas are relatively benign in their health and environmental impacts, but their supplies are in greater danger of exhaustion; coal and uranium are more plentiful, but their attendant risks are greater. Any plausible principles of intergenerational justice must address questions of risk as well.

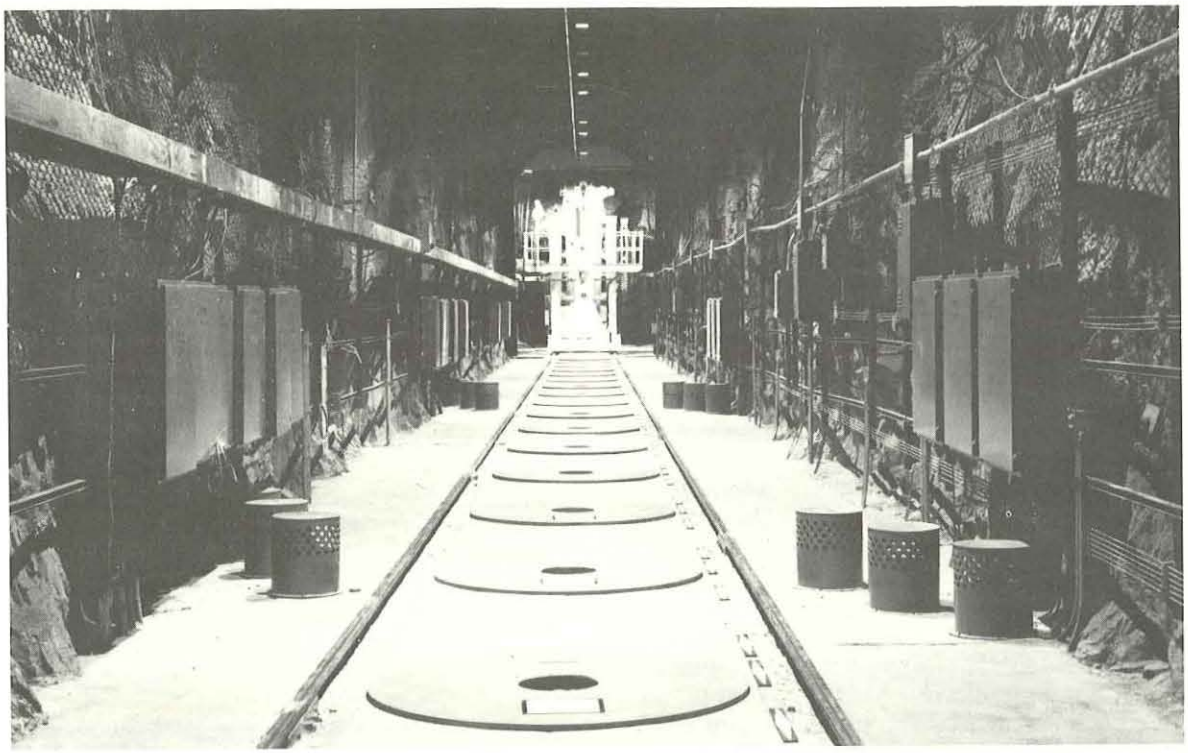
Risk and Neutrality

In ordinary cases we think that it is wrong to impose harm on innocent persons, or to impose a significant risk of harm, without first obtaining their free and informed consent. We think that it is wrong to impose risks on unconsenting others even when those put at risk receive as a result still greater benefits. Even less, of course, do we think that risks can be imposed that benefit the risk-imposers at the risk-bearers' expense. At the very least, where harm is unavoidable and consent unobtainable, compensation is owed the sufferer, as a matter of justice.

These widely accepted principles governing risk imposition apply, if anything, with greater force when risks are imposed across generations. Although temporal distance does increase uncertainty about the possible consequences of our actions (who can say how likely it really is that radioactive wastes produced today will cause cancer five hundred generations hence?), two other factors heighten the moral seriousness of intergenerational risk imposition.

In the first place, there is obviously no way to obtain the free and informed consent of future persons to risks created by current energy policies, so this basic condition on risk imposition cannot possibly be met in the intergenerational case. Second, the present generation reaps most of the benefits from the energy produced, while future generations bear most of the risks. Writes Barry: "With some examples such as nuclear power plants, the benefits and risks are asymmetrically distributed across time: the benefits disproportionately occur while the plant is producing electricity, and the risks continue in some form for thousands of years, until the radioactivity of the waste decays to a safe level." Richards concludes: "This divergence of benefit and burden, combined with the future generation's lack of any voluntary choice in the matter, appears to make intergenerational cases of foreseeable risk imposition morally more questionable than comparable intratemporal cases . . . and any cost-benefit analysis that suppresses or ignores this moral feature is flatly unethical."

These considerations suggest a principle of intergenerational neutrality: A policy is considered neutral if the risks it imposes on future generations are not greater than the risks they would otherwise face if we did not adopt this policy. Applying the neutrality principle to the disposal of long-lasting toxic wastes from



DOE Photo

Spent Fuel Storage Test Facility
The toxic radioactive wastes generated by commercial nuclear power and defense nuclear activities will be with us for millennia to come.

nuclear power plants, Thomas B. Cochran, Staff Scientist at the Natural Resources Defense Council, argues that risks of nuclear power are to be assessed by comparing the risks of the processed radioactive wastes with the risks of the unmined ore. He proposes, "Nuclear operations of all types should be conducted so the overall hazards to future generations are the same as those that would be presented by the original unmined ore bodies utilized in those operations." This standard could be met by emplacing wastes in an artificial "ore body" with characteristics identical to those of the original unmined ore. Unless Cochran's strict standard can be met in some such way, the risks otherwise imposed on future generations by nuclear power suffice to rule it out of consideration.

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Cochran's proposal for nuclear waste disposal may seem too narrowly focused, however, when we consider the perhaps equally grave and certainly shorter-term risks created by nuclear power's leading alternative. Although coal, unlike nuclear power, is nonrenewable, supplies are bountiful enough to provide energy for centuries. But the burning of coal and other carbonaceous fuels causes a dangerous build-up of atmospheric carbon dioxide (CO_2); the eventual global warming predicted if CO_2 build-up continues could ultimately melt the polar ice caps, causing major flooding and agricultural dislocation. Furthermore, CO_2 build-up may approach ominous levels even in some of our lifetimes. According to Bodde, "The range of uncertainty may be greater for CO_2 than for radioactive waste, but to the extent that a problem exists, it is likely to impinge upon us in the next fifty to two hundred years."

Thus Bodde argues that the risks from nuclear power cannot be assessed independent of the whole constellation of risks posed by alternate forms of energy use—or indeed, by the whole complex of technology that drives and sustains modern life. He replies to Cochran that "if our moral concern is the preservation of equal opportunity for future generations . . . then our duty is to create solutions to the disposal of radioactive waste in the context of the other threats to human existence, rather than in isolation. This implies a more holistic approach than has heretofore been taken."

Neither of the two leading alternatives to the most rapidly diminishing nonrenewables, then, provides an easy solution to the problem of intergenerational justice. It may be impossible to avoid leaving the world a substantially riskier place than we found it, though, again, we should apply our technological ingenuity to reducing the risks produced and pass on added capital as a compensation fund for the future victims of our current choices.

Facing the Future

Bodde suggests three "necessary elements of any energy policy that would seek equality of opportunity for future generations":

- resource-balancing strategies that assess the risks of nuclear power and carbon dioxide in the context of the overall energy picture;
- technological progress to ensure compensation for depletion of nonrenewable resources;
- nurturing of institutions, national and international, whose scope and capabilities match the nature of the social and technical problems before them.

This last element of Bodde's program may be the most essential. He writes: "National institutions tend to select some problems (such as radioactive waste) for detailed attention while neglecting others (such as CO_2 build-up) . . . because we tend to work on that for which the societal instruments exist." National institutions are already in place to address, if not to resolve, the problem of nuclear waste disposal; atmospheric CO_2, by contrast, does not respect national boundaries and so cannot be handled by institutions on a national scale. "It seems clear that our obligation to future generations includes the building of institutions of sufficient scope to deal with the problems we bequeath them."

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The way we produce and distribute energy has much to do with how we live the rest of our lives; it may have even more to do with how future generations live theirs. Energy is power, and oil power, coal power, and nuclear power can translate into economic and political power, as events of the past decade have made only too clear. Adequate institutions to control and contain this power may be the energy-related legacy that we should most endeavor to leave behind us.

The views of David Bodde, Brian Barry, David A.J. Richards, Talbot Page, and Thomas B. Cochran are drawn from their chapters in Energy and the Future, *edited by Douglas MacLean and Peter G. Brown, Maryland Studies in Public Philosophy (Totowa, N.J.: Rowman and Littlefield, 1983). To order, see page 15.*