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# What Kind of Environment Do We Owe Future Generations?

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## WHAT KIND OF ENVIRONMENT DO WE OWE FUTURE GENERATIONS?

by  
*Neil H. Buchanan\**

*Despite widely held beliefs that current generations bear heavy obligations to look out for the welfare of future generations, the philosophical case in support of such intergenerational obligations is surprisingly tentative. Moreover, quantifying any such obligations is subject to even greater uncertainty. Even so, current generations bring future generations into existence in the knowledge that doing so will put a claim on resources that could have been used to reduce suffering among people who are already alive. The choice to allow living people to suffer and die, and instead to bring forth more people in the future, thus implies a moral imperative to provide a life for future generations that is worth living.*

*Many policies—such as so-called green technologies—that could improve the lives of future generations could bring about greater prosperity for current generations as well. The potentially difficult policy choices are those that represent a clear trade-off: decreasing future generations’ living standards as a means of providing current and future generations with a better environment. Because future material living standards are projected—even under the most pessimistic scenarios—to be much higher than living standards today, it is possible to give future generations both a better environment and a much higher material standard of living than people enjoy today. Claiming that pro-environmental policies will harm future generations, therefore, amounts to observing that it would be possible to give future generations even higher incomes—along with a dirty planet. We should, therefore, not be hesitant to transform some future material prosperity into an inheritance that will truly benefit future generations: a livable world.*

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## I. INTRODUCTION

Politicians in the United States love grandchildren. At least, they love to talk about how much they love grandchildren. In virtually every policy debate in the United States, each side invokes the interests of the current generation's children and grandchildren.<sup>1</sup> In some situations, it is only the next two generations that are under discussion, because the policy in question will affect everyone who is alive today; but in others, the phrase "children and grandchildren" serves as a proxy for all future generations, born and not yet born.<sup>2</sup> Politicians who appeal to the interests of future generations, of course, hope to claim the moral high ground by showing that their preferred policies will protect helpless innocents, that is, those future citizens who literally cannot yet participate in the political process, and whose futures will be significantly shaped by the decisions made by today's adults. No sensible public figure, therefore, would wish to be seen as ignoring the interests of future generations.<sup>3</sup>

Despite universal claims that political decisions must be made in the interests of future generations, policies in the United States continue to allow human activity to create serious and growing damage to the

<sup>1</sup> See, e.g., Katherine Ling, *CAMPAIGN 2010: Obama Trying to Turn Election Tide with 'Clean Energy' Emphasis*, GREENWIRE (Oct. 4, 2010), <http://www.eenews.net/public/Greenwire/2010/10/04/1> ("[M]y administration has made an historic commitment to promote clean energy technology. . . . We're putting Americans to work producing clean, homegrown American energy that will help lower our reliance on foreign oil and protect our planet for future generations.").

<sup>2</sup> See, e.g., *Hearing on S. 1733, the Clean Energy Jobs and American Power Act Before the S. Comm. on Env't & Pub. Works*, 111th Cong. (2009), available at CIS S 32-20091028-01 (LEXIS) (statements of Sen. Benjamin L. Cardin and Peter Brehm, Vice President of Business Development and Government Relations, Infinia Corporation) (interchangeably using the terms "future generations," "children," and "grandchildren").

<sup>3</sup> Cf. Daniel A. Farber & Paul A. Hemmersbaugh, *The Shadow of the Future: Discount Rates, Later Generations and the Environment*, 46 VAND. L. REV. 267, 291 (1993) (assuming that most people believe there is a responsibility to consider the interests of future generations).

environment. Decades of concern about environmental damage have, of course, caused some significant successes: once-polluted waterways have again become capable of sustaining aquatic life, cars no longer spew lead into the air, and recycling campaigns have steered tons of waste away from landfills and back into the economic pipeline.<sup>4</sup> To put these successes in some recent historical perspective, we can at least say that no river in the United States is likely to catch fire again anytime soon.

Clearly, however, there is much more that could be done. Environmental damage continues to accumulate, with devastating effects on human health, animal life, and entire ecosystems.<sup>5</sup> We continue to use energy sources that are devastating to the planet when they are extracted, when they are burned, and when we dispose of their wastes. The environmental effects of these human activities are sometimes obvious, as when millions of gallons of oil gush into the Gulf of Mexico; but they are often hidden, such as the slow death of coral reefs.<sup>6</sup> Whether hidden or obvious, however, we know that it takes time and effort to undo the damage. Cleaning up after human activities is not cheap or easy, but it is necessary.

Or is it? If we were willing and able to live with the consequences of human economic activity, we would actually view it as wasteful and foolish to expend serious efforts to undo what we have done. Few people, for example, would plan to build houses to use during their lifetimes and then dismantle the houses before they depart. We are apparently comfortable believing that at least some of the profound changes that come with our presence on the planet are unobjectionable. Not everything must be undone. Not every landscape must be returned to its condition before we arrived.

Decisions to reduce or undo human changes to the environment, therefore, are not the default position. Lines must be drawn to determine how much is too much, both aesthetically and in terms of pollution's effects on human and other life. The lack of absolutes, in turn, implies that difficult choices must be made to set limits on the amounts and types of environmental changes that humans create.

Those choices would be difficult enough if everyone who would be affected by those choices could be included in the decision-making

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<sup>4</sup> See, e.g., *Four More PA Streams Added to EPA's List of Cleanup Success Stories*, PR NEWswire, Feb. 2, 2010, available at <http://www.prnewswire.com/news-releases/four-more-pa-streams-added-to-epas-list-of-cleanup-success-stories-83372647.html>; *National Challenge Inspires U.S. Cities to Recycle Over 125 Million Aluminum Cans: "Cans for Cash" Winners Announced at U.S. Conference of Mayors Winter Meeting*, PR NEWswire, Jan. 22, 2010, available at <http://www.prnewswire.com/news-releases/national-challenge-inspires-us-cities-to-recycle-over-125-million-aluminum-cans-82383932.html>.

<sup>5</sup> See, e.g., John M. Broder & Tom Zeller, Jr., *Bad. But an Apocalypse?*, N.Y. TIMES, May 4, 2010, at A1 (discussing the effects of the Deepwater Horizon oil spill).

<sup>6</sup> See *id.*; see also Abdulsamad Haidari, *Fighting to Save the Rainforests of the Ocean*, DAILY OUTLOOK AFG., Dec. 14, 2009, available at 2009 WLNR 26336749.

process.<sup>7</sup> If the political system were capable of processing and reflecting a broad consensus on how much environmental damage people were willing to accept, then the policy concerns could be reduced to how best to meet the goals of that consensus, while ensuring that the concerns of those who dissent from the consensus are fairly considered in the process of making policy. This is never easy in practice, of course, but it is at least a relatively uncontroversial approach to governance: create a political system in which the interests of the affected parties can be reconciled, and proceed from there to a political resolution and policy regime.

The fundamental difference in setting environmental policy, of course, is the nagging problem that decisions today affect not just the people currently involved in the political process but those who cannot participate as well.<sup>8</sup> Because there is no way to bring those future parties into the process directly, the political process must somehow find a way to represent their interests in juxtaposition to the interests of those who are currently voting adults.<sup>9</sup>

This does not mean, however, that current generations must elevate the interests of future generations above all else. Taking into account the interests of one party is clearly quite different from catering to its every desire. Moreover, since there is no way even to know what those parties would desire, at least for those who have not yet been born or reached adulthood, responsible political decisions must ultimately be based on two difficult steps: first, guessing what future generations would want us to do, and second, balancing those likely wishes against the legitimate interests of current generations.<sup>10</sup>

This Essay addresses the question of generational justice with respect to environmental issues, from the perspective of policy choices in the United States. The analysis focuses first on the basic philosophical question of what one generation owes any other generation or generations. Concluding that the range of defensible choices available to current generations is surprisingly broad—including doing nothing at all to help future generations—it becomes important to know what future generations of Americans would receive from current generations, both economically and environmentally, if no policies were changed henceforth. The issue then becomes whether environmental protection should be purchased by trading off future material economic well-being, especially given the very high material living standards that future

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<sup>7</sup> See RICHARD E. JUST, DARRELL L. HUETH & ANDREW SCHMITZ, *THE WELFARE ECONOMICS OF PUBLIC POLICY: A PRACTICAL APPROACH TO PROJECT AND POLICY EVALUATION* 579 (2004) (noting that future generations are necessarily left out of the decision-making process).

<sup>8</sup> See Barton H. Thompson, Jr., *The Trouble with Time: Influencing the Conservation Choices of Future Generations*, 44 NAT. RESOURCES J. 601, 602 (2004).

<sup>9</sup> See JUST, HUETH & SCHMITZ, *supra* note 7, at 579.

<sup>10</sup> See Farber & Hemmersbaugh, *supra* note 3, at 291.

generations are very likely to inherit.<sup>11</sup> The analysis then broadens to ask whether there are policies that can help both current and future generations. Happily, the answer to that question is a resounding “yes,” meaning that the presumed conflict between generations is often more theoretical than real. It is possible to make everyone better off, if policies are chosen wisely—and so long as policy choices are made with special attention to the effects of those policies on the most vulnerable people in society.

The results of this analysis are thus clear and stark: If we are going to bring future generations into existence, we will do so at the cost of improving the lives of billions of currently living people. That choice implies a moral commitment to making the lives of future generations worth living. Future generations deserve a livable planet, first and foremost. Moreover, nothing that has been proposed to date to mitigate environmental harms would come close to making future generations worse off—in the material terms commonly used to measure economic well-being—than are today’s generations of Americans.<sup>12</sup> There is, in other words, a broad range of win-win choices. Even if we are highly aggressive about fighting environmental damage, we can still leave future generations with both a better environment and a higher material standard of living.

## II. JUSTICE BETWEEN GENERATIONS

Every decision made by a government closes off other possibilities, even as it sets in motion a new set of choices that will face future policymakers. In the nineteenth century, such decisions as the Louisiana Purchase, the Homestead Act, or all of the fateful choices that led to the Civil War all affected not just the people then living but every generation to follow. In that fundamental way, all generations are the product of the decisions of those who preceded them. At any moment, a choice can be made in the belief that its consequences will not be so momentous as to affect future generations significantly; but the distinction is a matter of degree. We know that decisions today will change the future, even if we do not yet know the form or extent of those effects.

The idea that each generation’s decisions have long-term effects that will continue long after that generation has passed on, therefore, is hardly a novel or radical observation.<sup>13</sup> Even so, the mere fact that decisions today actually will affect future generations does not necessarily mean that today’s decisions should be altered in any way out of concern for those possible future consequences. Knowing that we will change the

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<sup>11</sup> See *id.* at 292.

<sup>12</sup> See NICHOLAS STERN, *THE ECONOMICS OF CLIMATE CHANGE: THE STERN REVIEW* 233–34 (2007).

<sup>13</sup> See, e.g., Edith Brown Weiss, *Our Rights and Obligations to Future Generations for the Environment*, 84 AM. J. INT’L L. 198, 200–01 (1990).

future does not automatically mean that we must care about the changes that our decisions might cause. Without a theory of moral obligation, no person or group of people has any reason to care about the lives of others. Why should today's decision makers—officeholders or voters—change what they do in recognition of future people's interests? Surprisingly, this is a basic question with which philosophers have struggled to find a satisfying answer. Ultimately, the case for caring about future generations is much more difficult to sustain than many of us tend to believe.<sup>14</sup>

A. *Do Current Generations Owe Anything to Future Generations? The Surprisingly Difficult Case for Intergenerational Obligations*

People living today know that there will be future generations of people, so long as humans do not destroy themselves through war, disease, or a universal decision to simply discontinue procreating. People living today also know that their decisions to clear forests, to build roads, to develop thinking computers, and every other economic and social activity will change the world as time moves forward. How, if at all, should our knowledge of those consequences change the decisions that we make?

The most promising approach toward building a moral foundation for intergenerational obligation is based on the simple concept of avoiding harm to other living beings.<sup>15</sup> If we accept as a starting point that people should not harm other people if such harm can reasonably be avoided, then it seems a natural next step to point out that decisions today might inflict harm on people tomorrow, next year, or in the next century.

While it is a good start, that explanation ignores the variation in moral obligations that people feel when they sense greater or lesser connections with other people. Clearly, for example, many people who would swerve in their cars to avoid hitting small children do not take other (equally simple) actions that could reduce the incidence of childhood deaths. This means that, even when considering the consequences of one's decisions for people who are alive today, there are degrees of moral connectedness that alter how people make harm-avoiding decisions.

In the intergenerational context, the question of distance becomes more extreme. It is one thing to talk about the interests of today's children and grandchildren, but it is quite another to talk about the interests of people who will be alive ten, twenty, or one hundred

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<sup>14</sup> *But see* Farber & Hemmersbaugh, *supra* note 3, at 291 (stating that most people “agree we have at least some responsibilities to consider and provide for the welfare of future generations”).

<sup>15</sup> *See* Anthony D'Amato, *Do We Owe a Duty to Future Generations to Preserve the Global Environment?*, 84 AM. J. INT'L. L. 190, 193 (1990).

generations from now. Perhaps the simplest way to bridge that moral gap is through “intergenerational linkage,” that is, that each generation cares about its children (in some aggregate sense), and each generation will in turn teach its children to care about their children. In that way, every generation would care about the interests of all future generations.

As logically clever as that argument may be, however, it is still possible that people might not feel as strongly about those indirect connections to future people, especially as the distance in time begins to stretch into the future.<sup>16</sup> Even knowing that a future person is one’s great-great-great-great-grandchild, one might make a different decision than if the affected party were one’s own child.<sup>17</sup> Because the consequences of decisions become less certain as we look further into the future, it becomes easier for people to justify short-term gains and long-term losses when those long-term losses are not certain to occur.

It is not just the long-term consequences of today’s actions that are uncertain, however. Once we move past the lifetimes of people who have already been born, the consequences of today’s actions will be visited on a group of people who not only are not known to us today, but who need not be brought into existence at all. It is quite different to make a decision that will prevent a person from ever coming into existence than to end a life that already exists. Indeed, all decisions made today must, as a matter of simple causality, change the identities of the people who will actually exist in the future—because even small decisions today have a ripple effect that will change whom people meet and marry, how many children they will bear, and so on.<sup>18</sup>

Making decisions today that will change who those people are and the lives they will lead, therefore, is fundamentally different from harming living people today. In an important sense, humans alive at any particular time have no moral obligation to any particular unborn person who might come into existence in the future, because each possible future person has a vanishingly small chance of ever existing at all. Because every decision at every moment in time can change the future composition (including the size) of the human race, there is either no morally cognizable harm in decisions that change the life prospects of different potential future people, or any such harm is in a morally different category. There is, again, an enormous difference between ending a life today and making a decision that will prevent a life from being lived 200 years from now.

In the extreme, this line of reasoning could suggest that the truly superior moral choice would be to prevent future generations from even coming into existence. This is certainly a counter-intuitive notion, but if the choice is to help people today or to help people in the far-off future,

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<sup>16</sup> See Farber & Hemmersbaugh, *supra* note 3, at 295 & n.107 (“Empirical studies support this observation.”).

<sup>17</sup> See *id.* at 295.

<sup>18</sup> See D’Amato, *supra* note 15, at 191.

there is a very defensible moral case that we should favor the present over the unknown and contingent future. It might, in short, be better if future generations never came into existence.

*1. Is the Future Too Grim to Allow Future People to Come into Existence?*

This is not, however, the familiar argument that life is nasty, brutish, and short, making it immoral to bring future generations into existence, dooming them to the inevitable miseries of life and death—miseries that might only grow with time as the world spins out of control. Such a view would purport to be a selfless one on the part of current generations, seeming to take into account only the interests of those people who would make up possible future generations, while ignoring the needs and desires of today's adults. There is a genuine selflessness—even anguish—in the conclusion that “I could not imagine bringing a child into a world doomed to wars, terrorism, pollution, murder, and depravity.” That conclusion—that we should give up now and not allow people to be born in the future, for their own good—could thus be described as a regrettable but morally justifiable conclusion, based only on a grim assessment of the lives that future human beings would inevitably lead.

Such a decision, however, would be based on the almost certainly incorrect conclusion that there is nothing that we could do today to provide the basis for a livable future for human beings beyond the next few decades. It is true that things might become that bad, because human activities in many areas are making it less likely that there will be a hospitable environment within which to live fulfilling lives in the future. As a matter of policy choice, however, it would be a profound abdication of responsibility to summarily conclude that there is nothing that could be done today to save the future, leaving us with no choice but to pull the plug on hopes for a future for humanity. This attitude would, therefore, be deeply selfish, because it would mean that people today would be giving up on an extended future for humanity simply because they could not figure out how to change the dangerous directions in which the world is apparently headed.

There are, in other words, still policies that we could adopt today that would allow humanity to survive well into the future; and if we do not choose to adopt those policies, we would need a morally justified reason for making that decision. That reason might be that we have tried everything that we can think of to change the course of human events. At this point, however, that simply seems not to be true as a statement of human capacity. Progress on many fronts is halting and frustrating, and progress is far too often reversed. To say that there is simply nothing more that we could be doing, however, is almost certainly wrong.

*2. Weighing the Interests of Current and Future People*

There is, however, a much stronger argument supporting the idea that future generations should never come into existence. Rather than being an abdication of responsibility for making choices to reduce human misery, moreover, this argument would be based firmly on the

idea that decisions today should minimize people's pain and maximize human fulfillment. Furthermore, it would be based on the idea that people who are alive today have greater moral significance than the infinite number of potential people who could exist in the multitude of future paths that history could follow.

Imagine that it would be possible to make all people currently alive today—everywhere in the world—live long, healthy, and fulfilling lives. Achieving that happy outcome, however, would require economic changes that would deplete the earth's resources and pollute the air and water so profoundly that human life would cease to be possible on Earth before the next turn of the century. To make the mental exercise simple, imagine that the planet's capacity to support life could be managed in such a way that it would be depleted just as the last person living today drew her last breath. People could be told in advance that any child born henceforth will die on that same day, leaving the moral choice to them as to whether they would be willing to bear children doomed to such a fate; or there could be a policy simply to ban all future reproduction. For purposes of this mental exercise, what matters is that current generations would decide to despoil the planet in the pursuit of mitigating human suffering for those who are alive today.

It seems likely that most people would view such a policy decision as immoral, because it would mean the inevitable end of humanity. The moral calculus of such a decision, however, is surprisingly compelling upon closer inspection. Rather than, as above, giving up on the future because of a collective belief that nothing can be done, this approach would say that it is better to prevent billions of currently living people from dying of very preventable diseases, famines, and wars, than to bring into existence future people to enjoy the lives that the vast bulk of today's people will never enjoy. The very unselfish conclusion could well be that it is better to make serious efforts to help real people who are suffering today, even if that could mean that future people would never be born (and, incidentally, never suffer or die).

There are, of course, reasonable objections to such a moral choice. It is possible that the infinite future of human happiness, in some grand utilitarian sense, would outweigh the misery of the billions of people today who are surely doomed to painful, early deaths. Moreover, it could be that there is no such thing as a "fulfilling" life for people who cannot bear children, or who can only bear children knowing that they are doomed to an early death. Knowing that humanity will continue, in other words, could be an essential element of being human and of living a happy life. In that case, the suffering of so many innocents today, while a cause for sadness, would nevertheless be justifiable in the name of something larger than any person's suffering.<sup>19</sup>

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<sup>19</sup> See generally Robert F. Woollard, *Introduction: Fatal Consumption (When Too Much Is Not Enough)*, in *FATAL CONSUMPTION: RETHINKING SUSTAINABLE DEVELOPMENT* 3, 3–17

This mental exercise is, therefore, a useful lens through which to view the implicit moral choices embodied in our current policies. Current generations have already implicitly chosen not to favor currently living human beings over hypothetical future ones. Although there has never been a vote on the matter, it is clear that one or more governments at any time in human history could have chosen the route described above: to do everything possible to make the lives of today's people bearable, even at the ultimate cost of preventing future people from ever coming into being. Passively, therefore, humans to date have chosen to elevate the interests of non-specific future humans over the interests of large numbers of people who have already been born.<sup>20</sup>

However, describing this history as a choice, even a passive one, might overstate the case. If people have never been given an explicit choice, nor had an open civic debate about that choice, they might not have ever considered it as a serious possibility. Moreover, a number of other possible explanations are available to explain why no significant group of humans has ever chosen to focus their resources exclusively on their currently living members. It could be that each group believes that it can simultaneously support both the living and the future—although this would not hold up to the evidence of continuing famines, poverty, and destitution. Coordination problems could also have prevented people from acting on their putative desires, with each person thinking that they would prefer the alternative, yet continuing to choose to have more children because that is the most direct way available for them to pass the blessings of happiness on to other humans.

However, given the universality of the choice that human societies have made to pass up the support of large groups of the currently living in a way that makes future generations possible, there is at least a strong suggestion that large majorities of humans throughout history have believed that providing for the unspecified future is an overriding goal of society. This mental exercise, therefore, demonstrates that there is ultimately a choice, and humans have chosen and continue to choose—albeit almost certainly without conscious deliberation—future people over current people. People of every generation to date have thus shown (at least indirectly) that they care about future generations, not just as an abstract concept, but in a choice between present pain and future happiness.<sup>21</sup>

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(Robert F. Woollard & Aleck S. Ostry eds., 2000) (stating that society must reduce its consumption to become sustainable into the future).

<sup>20</sup> See, e.g., Farber & Hemmersbaugh, *supra* note 3, at 291.

<sup>21</sup> See, e.g., GRUNDGESETZ FÜR DIE BUNDESREPUBLIK DEUTSCHLAND [GRUNDGESETZ] [GG] [BASIC LAW] May 23, 1949, BGBl. I, art. 20a (Ger.) (“Mindful also of its responsibility toward future generations, the state shall protect the natural foundations of life and animals by legislation and, in accordance with law and justice, by executive and judicial action, all within the framework of the constitutional order.”); KONSTITUCJA RZECZYPOSPOLITEJ POLSKIEJ [CONSTITUTION] Apr. 2, 1997, pmb.

Even if the philosophical theories that would support this choice are surprisingly weak, therefore, there is little doubt that humans—at a core level—care about guaranteeing the existence of future generations.<sup>22</sup> While there will inevitably be much disagreement over exactly what each generation's obligations to future generations might include, there is at least the tacit agreement that the core obligation is for each generation to allow future generations to come into being. It remains troubling that the moral case for such an obligation is relatively underdeveloped as a theoretical matter; but ultimately, given such strong evidence of agreement on the conclusion, the more useful inquiry might be to develop the moral implications of having chosen the future over the present.

*B. How Much Is Enough?*

If one can conclude, at least tentatively, that humans have shown (through their actions) a belief that there should be future generations of humanity, then it follows that current generations owe something to the future generations that they will bring into existence. The next important question is: How much? Do members of the current generation have a moral duty to allow future generations to come into existence in increasing sizes, with each generation increasing the overall population of the planet? Do current generations owe future generations a certain standard of living? Or a functioning economy? Is political freedom, or a certain kind of political system, part of what must be left for the benefit of future people?

As difficult as the basic question—whether *any* moral obligations exist from one generation to those that might follow it—might be, the “how much” question is even more difficult to answer. Philosophers have, it is not an exaggeration to say, simply not been successful in describing a moral theory by which one could describe the nature and (where relevant) quantity of one generation's obligations to its heirs.<sup>23</sup> In economic terms, for example, there really is no agreed-upon moral calculus that would allow a society to determine the material standard of living that one generation must pass on to those that follow. In areas of life that are less subject to quantification—the rule of law, encouragement and preservation of the arts, and so on—the question of degree is thus more difficult even to address, much less to answer.

In light of such a philosophical blank slate, a less-than-satisfying alternative is simply to try to determine what people think about the question, even if they have no firm sense of the moral basis for their

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(Pol.) (stating that the nation was “[o]bliged to bequeath to future generations all that is valuable from our over one thousand years' heritage”).

<sup>22</sup> See Matthew W. Wolfe, Note, *The Shadows of Future Generations*, 57 DUKE L.J. 1897, 1907 (2008).

<sup>23</sup> *Id.* at 1909.

beliefs. Here, however, human history offers more ambiguity than in addressing the question above—that is, whether there is an obligation to make future life possible at all. Even so, the broadest area of agreement seems to coalesce around an intuitive notion that people should make sure that “my kids will do better than me.” To be sure, this answer still offers little quantitative guidance, but it does at least create a crude baseline: Each generation should make sure that it leaves future generations *no worse off* than current generations.<sup>24</sup> As rough as the “no worse off” standard might be, the analysis below will show that this standard can be helpful in guiding environmental policy.

*C. The Unique Intergenerational Obligations Raised by Environmental Damage*

The nature of decision-making necessarily involves making choices that are, in a fundamental sense, irreversible. The choice to, say, build a shopping mall on a site that could have become a new housing development can be reversed in the sense that, after the mall is built, it can be torn down and replaced later with houses—or, for that matter, with a school, a nuclear power plant, or a cemetery. Yet that reversal of a previous policy does not change history. The workers who built the mall were unavailable to build other projects at that time; the land was used for a mall to the exclusion of other uses; and the process of later destroying the mall also involved the use of human and economic resources. Even though it is possible to rid ourselves of the mall, therefore, carrying out the initial decision to build it changed history in an irreversible way.

Although all decisions are thus irreversible in this logical sense, the nature of environmental change can be irreversible in a much more profound sense. It is possible to rebuild a mountaintop that was destroyed by the coal mining industry—though only at great cost and very imperfectly, with many lives lost throughout the process. It is not, however, possible to bring an animal or plant species back from extinction. Even the highly imperfect kind of reversibility that is possible in many other contexts, therefore, is clearly not possible in the case of many environmental changes.

The most threatening of such irreversible possible environmental harms, of course, is global warming.<sup>25</sup> If the worst predictions of climatologists were to come true, with the melting of ice caps leading to

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<sup>24</sup> See *id.* at 1908 (quoting Edith Brown Weiss, *The Planetary Trust: Conservation and Intergenerational Equity*, 11 *ECOLOGY L.Q.* 495, 498–99 (1984)). Professor Weiss develops the planetary trust concept further in her book *IN FAIRNESS TO FUTURE GENERATIONS: INTERNATIONAL LAW, COMMON PATRIMONY, AND INTERGENERATIONAL EQUITY* (1989).

<sup>25</sup> See generally Michael E. Mann, *Do Global Warming and Climate Change Represent a Serious Threat to Our Welfare and Environment?*, 26 *SOC. PHIL. & POL'Y* 193 (2009) (discussing the scientific background for global warming and the implications for society and the environment).

rising sea levels sufficient to submerge large and populated areas near the oceans,<sup>26</sup> there is nothing in the capacity of human technology that would allow humans to undo their previous catastrophic choices. Even if it were somehow possible to lower the temperature of the planet, and to take on the impossible task of rebuilding the ice caps, the climate changes that would accompany the initial warming—extreme weather disasters, droughts, and so on—would themselves wreak irreversible changes on all forms of life.

Even short of the most extreme consequences of global warming, moreover, the costs of undoing environmental damage will often (if not almost universally) be higher than the costs of avoiding the damage in the first place. The remediation efforts necessary to remove cancer-causing pollutants from the Hudson River have already exceeded a half billion dollars,<sup>27</sup> with the “far more expansive”<sup>28</sup> second phase of the cleanup expected to cost hundreds of millions more<sup>29</sup>—and even those efforts are halting and incomplete after decades of very expensive litigation.<sup>30</sup> More than 20 years after the Exxon Valdez oil spill in Alaska, the environmental damage has not been fully remediated.<sup>31</sup> The costs and consequences of the BP oil spill in 2010 in the Gulf of Mexico are still too vast and uncertain to measure.<sup>32</sup> Whatever those costs ultimately are, it is a safe prediction that much of the damage will never be undone.

In this way, even though environmental damage and economic damage are both irreversible in a strict sense, they are not the same kind of damage. Even during economic prosperity, there is generally a bit of slack in the productive capacity of an economy, since many workers do not work overtime, and factories are not all running as continuously as they might. Therefore, a temporary reduction in a nation’s gross

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<sup>26</sup> See Tom Gardner, *Scientist: Global Warming Could Melt Ice Caps, Eliminate Half of Earth’s Species*, USA TODAY, Jan. 11, 2007, [http://www.usatoday.com/weather/climate/2007-01-11-hansen-warming\\_x.htm](http://www.usatoday.com/weather/climate/2007-01-11-hansen-warming_x.htm) (warning that, as an example of the type of damage that could occur in a plausible climate change scenario, parts of Florida and Georgia would become submerged by rising ocean levels).

<sup>27</sup> Michael Hill, *Hudson River PCB Cleanup Has Cost \$561M So Far, GE Says*, DAILY FREEMAN, Apr. 30, 2010, <http://www.dailyfreeman.com/articles/2010/04/30/news/doc4bdb595da4f0c673736077.txt> (reporting GE’s estimate of \$561 million as its cost of Phase One of the Hudson River dredging project to clean up “PCBs, or polychlorinated biphenyls, [which] are considered probable carcinogens”).

<sup>28</sup> *Id.*

<sup>29</sup> See *id.* (“There were outside estimates that both phases of the project could cost \$500 million when the EPA called for the cleanup in 2002, though more recent estimates put the total cost at over \$700 million.”).

<sup>30</sup> See Editorial, *G.E.’s Latest Maneuver*, N.Y. TIMES, Oct. 2, 2010, at A18, available at <http://www.nytimes.com/2010/10/02/opinion/02sat3.html>.

<sup>31</sup> See S. Brady Calhoun, *Gulf Oil Spill: Lingering Disaster?*, NEWS HERALD, Oct. 3, 2010, available at <http://www.newsherald.com/articles/lingering-87436-long-oil.html>.

<sup>32</sup> See Ian Walker, *BP Pledges Assets as Gulf Spill Collateral*, WALL ST. J., Oct. 1, 2010, <http://online.wsj.com/article/SB10001424052748703859204575525482920628758.html> (estimating the costs to be \$11.2 billion).

domestic product can be reversed later, in a way that leaves future generations unaffected, because the economy that is bequeathed to future generations can have the same level of income and the same amount of technology and productive capital as it would have had without the temporary change. As a policy matter, it is not always the case that a society would want to undo that type of economic damage, depending on other priorities; but the point is that it is possible. Many environmental harms are different from economic harms, therefore, because they are irreversible in a deeper sense than the simple irreversibility of time.

Finally, there is a category of ultimate irreversibility. If we are willing, as we apparently are, to allow pain and suffering to be visited upon so many of those who are currently alive, in the name of future generations, then our most important moral obligations have to do with existential threats to future generations. The greatest responsibility that one generation takes on is thus to allow future generations to exist. This puts not just global warming, but issues surrounding both nuclear power and nuclear weapons—both of which carry the potential to make the Earth uninhabitable—on a different moral plane from the possible harms of human activity that fall short of making life impossible. Not all environmental harms are of such a high order, of course, but environmental damages figure prominently on the list of existential threats to human life.<sup>33</sup>

Therefore, even though it is surprisingly difficult to build a case for one generation's obligations to another, it is possible to observe that humans systematically act in ways that suggest that people have accepted a sense of intergenerational duty. The possible responses to this are to argue that people might want to change those attitudes and actions in ways that could mitigate massive human suffering in the here and now, or to accept the moral choices implied by those underlying attitudes and draw out the implications of taking those moral choices seriously. If, in other words, we are not willing to destroy the environment for the morally defensible reason that doing so could help billions of vulnerable people who are suffering today, then we should make sure that the decisions we are making to guarantee the possibility of future life are logically coherent. In the hierarchy of harms to avoid, environmental damages—especially those on a large scale—thus hold a special moral primacy over other interests.

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<sup>33</sup> See generally Samuel S. Myers & Jonathan A. Patz, *Emerging Threats to Human Health from Global Environmental Change*, 34 ANN. REV. ENV'T & RESOURCES 223 (2009) (discussing how environmental changes are producing significant vulnerabilities for segments of the human population).

### III. TRADE-OFFS BETWEEN THE ECONOMY AND THE ENVIRONMENT

The debate over global warming has generally been waged over the scientific issues: whether the climate is changing and whether any such change has been caused—in whole or in significant part—by humans. With a clear scientific consensus that the answer to both of those questions is “yes,”<sup>34</sup> further technical questions follow: How much damage will the changing climate do to the planet and to the living standards of its inhabitants (human and non-human)? Will the planet become unlivable? Have we already passed the point of no return, such that the coming damage, while regrettable, can no longer be prevented (although it can be anticipated, allowing people to prepare appropriately)? If it is still possible to stop the worst effects, how much damage can be avoided, and through what means?

As the debate turns toward questions of mitigation strategies, the questions that had seemed to be about climate science and engineering have become more obviously questions involving a heavy dose of economics.<sup>35</sup> Once we have concluded that the climate is changing, no matter the reason and no matter how irreversible, all of the questions become explicitly about costs and benefits. If the climate will inevitably change our lifestyles, what can we do to adapt (either permanently, or as we await an inevitable time when life dies out entirely)? Must entire populations be relocated, leaving whole regions abandoned by humans, or can existing populations respond to climate change where they are? If the climate can be prevented from changing, must we undo some of the damage already done, or can we satisfy ourselves simply with doing no further damage?

Making such choices involves comparing costs and benefits; and while climate scientists and engineers can tell us what is possible, old-fashioned economic analysis can usefully be applied to difficult choices among the various options available. There is no intrinsically right answer to any question involving choices. Even if, for example, we knew that we could undo all of the damage inflicted by man thus far on the planet’s ecology, doing so might be so expensive that we would be better off mitigating the harms rather than reversing them, or only undoing some of the damage rather than all of it.<sup>36</sup> Or the opposite could be true, which would require an all-out effort to undo humanity’s massive impact on the

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<sup>34</sup> See INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, CLIMATE CHANGE 2007: SYNTHESIS REPORT, 36–37 (Core Writing Team, Rajendra K. Pachauri & Andy Reisinger eds., 2008), available at [http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4\\_syr.pdf](http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr.pdf).

<sup>35</sup> See, e.g., Farber & Hemmersbaugh, *supra* note 3, at 300–02.

<sup>36</sup> See Neil H. Buchanan, *Oil Spills, Mine Disasters, and Everyday Environmental Degradation: The Suddenly Unhidden Costs of Our Standard of Living*, FINDLAW (May 6, 2010), <http://writ.news.findlaw.com/buchanan/20100506.html>.

planet thus far. There is, in short, no presumptively correct choice, even if one of the choices is a return to a pastoral world with no human footprint.

A. *Environmental Options and Economic Choices*

The fundamental economic problem of comparing costs and benefits is, however, immeasurably more difficult in the area of environmental harm, especially climate change. Because climate change, as well as any efforts to undo or mitigate climate change, takes place over the space of decades or centuries, the weighing of costs and benefits involves not just the current generation's assessments of those magnitudes.<sup>37</sup> It also necessitates our making guesses about how generations yet unborn would weigh those costs and benefits. If, as discussed above, current generations have decided that it is morally imperative to allow future generations to come into existence, then it is likely that current generations would also want to allow those future generations to enjoy that existence. Even if that sense of obligation is weak or nonexistent, moreover, it is helpful to think about whether there are choices available today that could benefit current generations without changing the prospects of their children's children, or that could benefit future generations by making a trade-off that is of no import to current generations.

The global warming debate, therefore, involves not just climate science and economics, but moral philosophy as well.<sup>38</sup> We cannot make any decisions with long-lasting effects without asking a fundamental—yet ultimately unanswerable—question: What would future generations want us to do? The desires of future generations should not prevent current generations from taking their own desires into account, but any analysis is incomplete without a conscious assessment of how any policy choices would be viewed by every affected party, living and not yet living.

Deciding how to improve the lives of future generations is, however, not a simple matter of making the choices that current generations would make for themselves. If current generations, for example, yearn for a return to a more natural lifestyle—regretting the centuries of human decisions that have resulted in dirty air, disease-laden waters, and despoiled landscapes—they might conclude that future people would be grateful for decisions made today that would make a return to a more natural lifestyle possible. This would result in policy choices designed to

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<sup>37</sup> See Jeff L. Lewin, *Which Externalities Should We Internalize? Comment on The Role of Law in Defining Sustainable Development: NEPA Reconsidered by Professor David Hodas*, 3 WIDENER L. SYMP. J. 327, 340–42 (1998) (discussing costs to current generations of internalizing environmental externalities and costs to future generations of not internalizing environmental externalities).

<sup>38</sup> See Farber & Hemmersbaugh, *supra* note 3, at 270 (“The discounting issue combines technical economics with philosophical conundrums.”).

give future people something that has been lost, most likely at a cost to current generations.

It is possible, however, that future generations would—if their opinions could be known in advance—tell us not to bother. At various times and places, the height of human advancement was considered to be the ability to rise above the natural environment.<sup>39</sup> There is, at least, no obvious reason why being closer to the earth is something that future generations would value.

Consider a very stark example: Suppose that there were a direct choice between providing consumer goods for future generations and giving them a breathable atmosphere that can sustain life. If it could be possible to provide breathable air through artificial means, such as gas masks, this would mean that there is a choice between creating a world where future generations can breathe naturally but lack certain consumer goods, or allowing a future world to come into existence in which people breathe artificially but have a much wider array of goods for their amusement. How would we know whether future generations would really want to trade their toys for the ability to breathe air the old-fashioned way? In fact, it is easy to imagine human attitudes adapting quite readily to a world that is so radically different from ours, with gas masks becoming a fashion item, sun-block creams being used for cosmetic purposes, and so on.

Even so, because it is not possible to ask future generations what they would prefer, current generations must speak for them. Ultimately, that is what the policy-making process is all about. Moreover, because of the problem of irreversibility noted above, any decision to take away environmental options must be weighed more seriously than decisions that can be changed at any point in the future with relative ease.<sup>40</sup> It seems at least plausible, therefore, that any decision based on a guess about what future generations might want should take into account how well that decision preserves the options of future generations. Absent a compelling reason, future generations should not be prevented from being able to choose even greener options, should it turn out that they value nature more highly than consumer goods.

In any event, the actual issues over which policy debates are currently being waged probably do not involve such stark choices. The best evidence available suggests that we could make decisions today to

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<sup>39</sup> See David G. Guest, *"This Time For Sure" – A Political and Legal History of Water Control Projects in Lake Okeechobee and the Everglades*, 13 ST. THOMAS L. REV. 645, 645–46 (2001) (discussing Florida's shortcomings in its attempts to control the environment through dredging and filling the Everglades throughout the nineteenth century).

<sup>40</sup> See Cass R. Sunstein, *Irreversible and Catastrophic*, 91 CORNELL L. REV. 841, 845 (2006) (discussing how irreversibility and catastrophe inform discussions on how to deal with safety, health, and environmental risks, and noting that "[w]hen regulators lack information about the likelihood and magnitude of a risk, it makes sense to spend extra resources to buy an 'option' to protect against irreversible harm until future knowledge emerges" (emphasis omitted)).

improve the environmental inheritance of future generations without lowering their material living standards. Indeed, many of the choices available today could both save the environment and help improve future material living standards. Therefore, while it is reasonable to worry about the possibility of extreme trade-offs, the actual range of policy choices allows for dramatic improvements in future environmental outcomes, while still allowing people's economic incomes to rise substantially.

*B. Material Living Standards and Human Happiness*

The United States has been the global economic leader since the middle of the last century. Coming out of the Great Depression and World War II, the United States resumed the path of increasing living standards that had begun with the Industrial Revolution in the latter half of the 1800s. Living standards in the United States, as measured by inflation-adjusted gross domestic product per person (real GDP per capita), has risen impressively for decades.<sup>41</sup> This has occurred while the population has more than doubled.<sup>42</sup>

Even so, the United States does not have the highest living standard in the world, even using the most conventional measures of economic well-being.<sup>43</sup> Moreover, the distribution of the rewards of the economy has become much less equal in the United States during the last few decades than in many countries with similar levels of national wealth.<sup>44</sup> We cannot say that living in this country provides a standard of material existence that is in any sense comfortable for a surprisingly large slice of the population. With poverty rates stubbornly high, especially among children, one cannot blithely assume that living in a rich country automatically means living well.<sup>45</sup>

There are, in addition, well-known concerns about using gross domestic product as a measurement of human economic well-being. Even basic economics textbooks note that GDP ignores some of the most

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<sup>41</sup> See UNITED STATES GDP PER CAPITA, TRADING ECONS., <http://www.tradingeconomics.com/Economics/GDP-Per-Capita.aspx?Symbol=USD> (showing the increase in GDP per capita over the last several decades).

<sup>42</sup> See U.S. CENSUS BUREAU, U.S. DEP'T OF COMMERCE, POL/02-MA(RV), MEASURING AMERICA: THE DECENNIAL CENSUS FROM 1790 TO 2000, at app. A-1 (2002), available at <http://www.census.gov/prod/2002pubs/pol02marv.pdf> (showing the results of each census from 1790 through 2000).

<sup>43</sup> See UNITED NATIONS DEV. PROGRAMME, HUMAN DEVELOPMENT REPORT 2010, THE REAL WEALTH OF NATIONS: PATHWAYS TO HUMAN DEVELOPMENT 143 tbl.1 (2010), available at [http://hdr.undp.org/en/media/HDR\\_2010\\_EN\\_Complete\\_reprint.pdf](http://hdr.undp.org/en/media/HDR_2010_EN_Complete_reprint.pdf).

<sup>44</sup> See James B. Davies et al., *The World Distribution of Household Wealth* 4 tbl.1 (United Nations Univ., Discussion Paper No. 2008/03, 2008); Timothy Noah, *Inequality Petard*, SLATE (Sept. 28, 2010), <http://www.slate.com/id/2268981/>.

<sup>45</sup> See U.S. CENSUS BUREAU, U.S. DEP'T OF COMMERCE, P60-238, INCOME, POVERTY, AND HEALTH INSURANCE COVERAGE IN THE UNITED STATES: 2009, at 14 (2009).

important elements of human life that people might value.<sup>46</sup> The two most important of those are the ability *not* to work, and the quality of the natural environment within which one lives.<sup>47</sup> Other problems include the difficulty in measuring economic outputs accurately or consistently (such as the problem of comparing the value of an owner-occupied home to a rental apartment), and such oddities as the GDP rising after natural disasters (because efforts to rebuild damaged communities are measured in GDP, while the destruction itself is omitted from such measurements).<sup>48</sup>

One possible response to this profound measurement issue is to broaden the measuring tool to take account of the various shortcomings that have been identified. Including the value of leisure, or subtracting the value of ecological harms, might improve the measure of economic income such that it would be more meaningful to people when the government announces that their incomes have risen or fallen.

Any such changes, however, will of necessity be imperfect; and, especially for matters relating to the environment, the difficulty in putting an economic value on various items to be included in an advanced GDP measure would be daunting, to say the least. Changing the measurement, therefore, does not really change the underlying problem of comparing economic goods with environmental harms. As valuable as it might be to try to improve GDP as a measure of well-being, doing so merely relocates any possible trade-off between economic outcomes and environmental outcomes into the standard of measurement itself. Continuing to use GDP as a measure of material economic well-being (conceding that it is flawed even for that more limited task), by contrast, permits the analysis to highlight any such trade-offs.

Gross Domestic Product should not, therefore, be thought of as a synonym for “human happiness.” On the other hand, it is not too far off to describe it as measuring material economic well-being, and as measuring the changes in material economic well-being that might be implied by environmentally motivated changes in policy. The important issue is not, in other words, to perfect the yardstick. It is to use the existing yardstick to measure what it currently measures, in contrast to what it does not.

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<sup>46</sup> See, e.g., IRVIN B. TUCKER III, SURVEY OF ECONOMICS 202 (1995) (noting that GDP “perpetuates the false dichotomy between economic growth and environmental protection”).

<sup>47</sup> See Eric Zencey, Op-Ed., *G.D.P. R.I.P.*, N.Y. TIMES, Aug. 10, 2009, at A17 (noting that unpaid domestic work and nature have value that is not included in the GDP).

<sup>48</sup> See *id.*; see also *What’s Wrong with the GDP as a Measure of Progress?*, PDFCAST.ORG (Feb. 6, 2010), <http://pdfcast.org/pdf/what-s-wrong-with-the-gdp-as-a-measure-of-progress>.

C. *Projections of Material Living Standards in the Future*

As noted above, the United States is—as measured by real (that is, inflation-adjusted) GDP per capita—among the richest countries in the world. To analyze the implications of policy choices for future generations, however, one important question is not the size of GDP today but its size in the future. If the economy is likely to provide a higher material standard of living in the future under the current policy regime, then a policy change that would decrease future GDP could still leave future generations with higher incomes than current generations enjoy.<sup>49</sup> That would not automatically justify a policy to reduce future GDP, of course, but it could change the moral calculus of doing so.

Each year, several federal agencies in the United States issue reports forecasting living standards going forward for several decades.<sup>50</sup> Because the Social Security system is inherently an intergenerational policy regime, it has become the custom for the Trustees of the Social Security system to issue annual reports forecasting the likely changes in various economic variables that are relevant not only to Social Security's internal financial prospects but—of central import to the current discussion—to assessing the likely economic prospects that will be inherited by younger generations as they move through their lifespans.

The Trustees' annual reports have become an authoritative source for forecasts of the path of the economy on a 75-year horizon. Although the Trustees do not provide forecasts that specifically show the change in real GDP per capita over that horizon, the annual reports do provide all of the data necessary to generate such forecasts. The annual reports, moreover, provide three scenarios for future economic outcomes, based on different assumptions about the path of key economic and demographic variables over time. For reasons specific to the Social Security program, even the most optimistic of those forecast scenarios is actually relatively pessimistic—or, at least, it is not based on economic assumptions that are notably different from the performance of the U.S. economy over the past 50 years or so.

Using those forecasting scenarios to predict the levels of income that might be enjoyed by the youngest of the currently living generations, as well as their children and grandchildren, it turns out that the long-term economic future facing this country is extremely robust. Even relatively small increases in living standards every year compound over time to

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<sup>49</sup> See Neil H. Buchanan, *Social Security is Fair to Future Generations* (unpublished manuscript) (on file with the author).

<sup>50</sup> See, e.g., BOARD OF TRUSTEES, FED. OLD-AGE & SURVIVORS INS. & FED. DISABILITY INS. TRUST FUNDS, THE 2010 ANNUAL REPORT OF THE BOARD OF TRUSTEES OF THE FEDERAL OLD-AGE AND SURVIVORS INSURANCE AND FEDERAL DISABILITY INSURANCE TRUST FUNDS, H.R. DOC. NO. 111-137, at 103 (2010), available at <http://www.ssa.gov/OACT/TR/2010/tr2010.pdf> (explaining that “[f]or the low-cost assumptions, annual growth in real GDP is projected to average 3.5 percent over the decade ending in 2019”).

raise material living standards far above the levels enjoyed by most Americans today. Specifically, the least pessimistic scenario shows that real GDP per capita in 2085 would be more than *four times* higher than in 2009.<sup>51</sup> The more conservative assumptions in the “intermediate scenario” imply per-person living standards more than *three times* higher than today’s levels.<sup>52</sup> Finally, the most pessimistic scenario, under which the economy would grow more sluggishly over the next 75 years than it has over any ten-year span in modern U.S. economic history, still implies material living standards that are significantly more than *twice* the level of today’s real GDP per capita.<sup>53</sup>

Naturally, any such long-term forecasts must be viewed skeptically. Even the most short-term economic forecasts have been regularly shown to be wildly off the mark. Nevertheless, there are a number of reasons to take these long-term forecasts seriously. First, as noted, the statisticians who generated the underlying economic assumptions provide more than one forecast scenario, and they erred quite deliberately on the side of pessimism in the assumptions that went into each scenario.<sup>54</sup> That makes these forecasts much more than a simple best-guess estimate of, say, a stock index’s performance over the course of a year.

Second, the variables on which these forecasts ultimately rely do not show great variability over time. Demographic trends are relatively stable and predictable, especially birth and death rates over rather long time spans;<sup>55</sup> and although net immigration can be more volatile, it is also much more responsive to policy changes. Moreover, long-term economic growth is ultimately based on likely increases in the productivity of future workers, which is in turn dependent on investments in education, business equipment, and technology. Even with occasional declines in the annual levels of those investments, this country has consistently invested—through both public and private entities—at sufficient levels to support continued increases in the productive abilities of future workers.<sup>56</sup> Failing to continue to do so would, of course, have profound implications for intergenerational equity, but there is every reason to

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<sup>51</sup> Author’s calculations, using data available from *id.* at 193.

<sup>52</sup> Author’s calculations, using data available from *id.* at 192.

<sup>53</sup> Author’s calculations, using data available from *id.*

<sup>54</sup> Charles P. Blahous III, *Have the Social Security Trustees Been Too Conservative?*, at 2–3 (Presentation to the American Enterprise Institute, Sept. 7, 2007), [http://www.aei.org/docLib/20070910\\_BlahousExtendedRemarks.pdf](http://www.aei.org/docLib/20070910_BlahousExtendedRemarks.pdf) (discussing the Trustees’ calculations and noting that “[s]ome previous Trustees’ reports have indeed erred on the side of excess conservatism”).

<sup>55</sup> Jagadeesh Gokhale & Kent Smetters, *Gaping Entitlement Imbalance*, WASH. TIMES, Mar. 28, 2004, at B3 (noting that “the problems facing Social Security and Medicare are driven by relatively stable and predictable long-term demographic trends”).

<sup>56</sup> Those investments lead to increased productivity by workers, which leads to the increased living standards summarized in, for example, the Trading Economics chart referenced earlier. *See* TRADING ECONS., *supra* note 41 (showing the increase in GDP per capita over the last several decades). Without higher productivity, those increased levels of GDP would not have been possible.

believe that the country's commitment to investing in future productivity will not be reduced significantly over the long term. If it is, it will be the result of explicit policy choices, not because the economy cannot generate higher future living standards.

Third, the Social Security Trustees' forecasts of much higher living standards have been highly stable over time.<sup>57</sup> That is, the annual reports prior to the Great Recession (from which the United States is currently emerging) provided forecasts implying the same range of future living standards—more than quadrupling, more than tripling, or more than doubling—as in the reports that have been issued in the two years since the recession began. If the largest economic downturn in the United States since the 1930s does not change the fundamentals of long-term growth, then there is reason to feel reasonably confident that such growth is resilient to unfavorable trends.

Finally, the sheer size of the predicted increase in real GDP per capita suggests that the future changes will be large and positive.<sup>58</sup> While time will tell whether the forecasts turn out to be accurate, it would take a very substantial change in the assumptions underlying the forecasts to make them pessimistic enough to make the future changes shrink substantially, and larger changes still to make them disappear entirely.

As noted, however, these forecasts are averages for the entire economy—an economy that has changed over the last generation to become much less equal in the distribution of its economic rewards. While it is safe to say that taking, say, 20% of income away from people living in 2085 would still leave the average person at that time substantially better off economically than the average person living today, it is possible that the costs will be borne by future people who are on the bottom end of the income spectrum—an income spectrum that, while higher on average, could still (if we do nothing about income distribution trends between now and then) have a low end that is anything but wealthy, or even comfortable.

The good news, therefore, is that there is a great deal of room to enact policies that could reduce future real GDP per capita below the elevated rates that would otherwise be created, yet still leave future people on average much richer than the average person is today. That is good news indeed. The bad news is that poorly designed policies could still lead to the costs being visited on those who are least able to afford them. This requires policymakers to be careful not just about how their

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<sup>57</sup> CHAD STONE & ROBERT GREENSTEIN, CENTER ON BUDGET & POL'Y PRIORITIES, WHAT THE 2008 TRUSTEES' REPORT SHOWS ABOUT SOCIAL SECURITY 4 (2008), *available at* <http://www.cbpp.org/files/3-27-08socsec.pdf> (noting that "the outlook for Social Security has been relatively stable").

<sup>58</sup> *See* BOARD OF TRUSTEES, FED. OLD-AGE & SURVIVORS INS. & FED. DISABILITY INS. TRUST FUNDS, THE 2010 ANNUAL REPORT OF THE BOARD OF TRUSTEES OF THE FEDERAL OLD-AGE AND SURVIVORS INSURANCE AND FEDERAL DISABILITY INSURANCE TRUST FUNDS, H.R. DOC. NO. 111-137, at 103 (2010), *available at* <http://www.ssa.gov/OACT/TR/2010/tr2010.pdf> (projecting a 3% increase in GDP over ten years).

policy choices might affect future incomes, but how those changes might affect people of different incomes. In short, intergenerational justice is not just a matter of looking at the changes in income between generations. It is also tied up very directly with distributive justice.<sup>59</sup>

#### IV. ENVIRONMENTAL POLICY AND ECONOMIC CONSEQUENCES

The standard assumption in nearly all debates about environmental policy is that being cleaner is more expensive than being dirty. Leaving behind a mess is easier and cheaper than cleaning it up. Therefore, the problem of environmental protection and remediation can be cast as a classic trade-off between economic growth and ecological protection. If this is true, then the moral choice underlying any pro-environmental legislation involves balancing lost economic income against the improvement in the health of the planet.

The unspoken assumption underlying claims by those who oppose policies to save the environment is that the trade-off is a simple one: higher incomes come at the cost of a poorer environment, whereas a better environment must make people economically poorer. This assumption, however, is not only contestable regarding whether there is truly a trade-off between pro-environmental laws and income, but it is also completely lacking in context. If “lower income” really means “income that is much higher than today, but a bit lower than it might have otherwise been,” then that can lead to a very different conclusion about the choices that living generations should make about policies that might affect their children and grandchildren.

##### A. *Trading Off the Economy and the Environment*

Opponents of bills that would address climate change proposed in the United States Congress often deride those bills as “job killers.”<sup>60</sup> Viewed narrowly, this attack is utterly irrelevant to intergenerational justice in environmental policy. Viewed broadly, however, the attack simply misstates the stakes in the environmental policy debate.

From a narrow standpoint, if pro-environmental policies were to cause some firms to lay off workers, this would be purely an intragenerational effect. That is, nearly all economists agree that, over the long run, the number of jobs in an economy will return to something approximating full employment. Or, to put the point more precisely, economists assume that any workers who are laid off due to any

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<sup>59</sup> See Lawrence B. Solum, *To Our Children's Children's Children: The Problems of Intergenerational Ethics*, 35 LOY. L.A. L. REV. 163, 176–201 (2001) (discussing intergenerational and distributive justice).

<sup>60</sup> See, e.g., Phil Kerpen, *Cap-and-Trade Energy Tax: Job-Killer with No Environmental Benefit*, AMS. FOR PROSPERITY TEX. BLOG (July 30, 2009), <http://www.americansforprosperity.org/072909-cap-and-trade-energy-tax-job-killer-no-environmental-benefit#ixzz13ccUIAy3>.

particular policy in the short run will be able to find alternative work within (at worst) a few years, allowing the unemployment rate to return to a low, steady level after recovering from a recession or other temporary disruption.<sup>61</sup> People who lose their jobs in a buggy whip factory eventually become employed in an automobile factory, and their children work in automobile factories before being forced to find jobs in high-technology industries. The transition can be wrenching, of course, but as a matter of intergenerational justice, it is beside the point that a particular policy causes people to move from one sector of the economy into others. Moreover, the entire notion of “green jobs” is based on the fact that people who have been forced out of jobs in environmentally damaging industries can be trained for work in the new industries that will come into being in response to changed environmental policies. In the short run, therefore, the attack on environmental protection policies—that they supposedly destroy jobs—is only as serious as our inability to put people back to work quickly, and to assist in their transition where necessary.

If, on the other hand, “job killer” is merely a colorful way of saying that a policy might decrease future incomes—in other words, everyone who wants to work can find a job, but the average job pays less than it otherwise would—then the broader question is whether decreasing future incomes is always a bad thing. Stating that there is a cost to doing something, after all, cannot be the end of the debate, not until we know both how difficult it is to bear that cost *and* the benefits that will flow from bearing the cost. The question is not whether there are costs *per se*, but whether those costs should be borne for a larger purpose.

The analysis above demonstrated that future generations will, on average, enjoy much higher incomes than people enjoy today. Enacting a policy change that reduces those incomes is, therefore, quite different from enacting a policy that would cause future incomes to be lower than today’s incomes. The point is that our best estimates of the future path of incomes suggest a win-win outcome, not in the sense that pro-environmental policies actually increase living standards (although they can), but in the sense that those policies can reduce incomes from the

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<sup>61</sup> See, e.g., CONG. BUDGET OFFICE, PUB. NO. 4156, THE BUDGET AND ECONOMIC OUTLOOK: AN UPDATE, at xv (2010), available at <http://www.cbo.gov/ftpdocs/117xx/doc11705/08-18-Update.pdf> (describing the forecast for the U.S. economy as it recovers from the Great Recession, assuming that the economy will return to its potential growth path, and concluding that “[b]eyond 2014, CBO projects, growth in real GDP will match the growth of potential GDP at 2.4 percent. In the agency’s projections, the unemployment rate averages 5.0 percent from 2015 through 2020”). An unemployment rate of 5% would represent a return to the levels seen in the prosperous economic times prior to the current downturn.

elevated levels that the economy is likely to provide, leaving future incomes higher as a net measure.<sup>62</sup>

The opponents of legislation to address environmental harms, therefore, must take into account the context within which any costs of that legislation will play out. The best estimates to date imply, in fact, that the cost of even the most comprehensive legislation in the United States to address climate change would reduce incomes by a tiny amount. For example, a nonpartisan government agency analyzed the cap-and-trade provisions in the recently defeated energy bill in Congress, concluding that those provisions would reduce GDP from its otherwise-elevated level by between 1% and 3.5% by 2050—against real GDP that will be approximately 2.5 times higher than today's GDP.<sup>63</sup> This means that assuming average income, which is close to \$50,000 today, would be either \$125,000 without the cap-and-trade regime, or between \$120,625 and \$123,750 with the regime.

Given the extremely small costs of one of the biggest proposals to date to fight global warming, therefore, the trade-offs implied by a variety of strategies—even enacted cumulatively—are very favorable. This means that, even if we were to adopt a highly aggressive regime to fight global warming, future generations would not only enjoy the benefits of a better environment, but they would still earn, on average, much higher incomes than people earn today.

As discussed above, moreover, even if there were no increases in future income, one could nonetheless easily imagine an ethical basis for deciding (however reluctantly) that future people should have lower economic living standards than those that exist today, in order to enjoy higher environmental living standards. The promising outlook for future incomes does not fundamentally change the nature of the trade-offs, but it certainly makes it possible to be less worried about policies that might trim a bit off the high incomes that will otherwise be available to future citizens.

This is not, however, a statement that all policies that might help the future environment can safely be viewed as helping future generations at an acceptable cost. Each policy must, of course, provide valuable benefits to future generations to justify the costs. Even so, the broad numbers are so favorable that it is a violation of the interests of future generations to

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<sup>62</sup> See Neil H. Buchanan, *What Do We Owe Future Generations?*, 77 GEO. WASH. L. REV. 1237, 1287 (2009) (concluding that future generations will enjoy higher standards of living than current generations).

<sup>63</sup> CONG. BUDGET OFFICE, PUB. NO. 4001, THE ECONOMIC EFFECTS OF LEGISLATION TO REDUCE GREENHOUSE-GAS EMISSIONS 2 (2009), available at <http://www.cbo.gov/ftpdocs/105xx/doc10573/09-17-Greenhouse-Gas.pdf>; see also Ian W.H. Parry & William A. Pizer, *Combating Global Warming*, REGULATION, Fall 2007, at 18, 21, available at <http://cato.org/pubs/regulation/regv30n3/v30n3-4.pdf> (“While there has been some controversy on this issue, the most recent research suggests that the overall costs of imposing a CO<sub>2</sub> tax of around \$5 to \$15 per ton . . . are small and perhaps even negative.”).

simply assume that they would always favor ever-higher incomes over the modest costs of significant environmental legislation.

For environmental legislation that is addressed to existential threats, moreover, the presumed trade-offs are even more meaningful. Even if it were necessary to reduce economic incomes by, say, 50% from today's levels (not from their much higher future levels) over the next 50 years in order to prevent the planet from becoming uninhabitable, it would be necessary to do so. If we do not at least take the steps necessary to guarantee the inhabitability of the planet for future generations, then there is no reason to pretend that we are doing them a favor by preventing their incomes from falling.

*B. A World Without Trade-offs?*

Not all policies to prevent environmental damage, however, require trade-offs in material living standards.<sup>64</sup> In a slightly different sense of the term "win-win," it is possible to engage in policies that both improve the environment and increase future living standards. This is not, however, a free lunch, because there is a cost. But it is borne by current generations, not future generations. Current generations can reduce their own consumption by moving economic resources into investments in future clean industries, which will raise real GDP per capita while reducing environmental harm.<sup>65</sup>

In fact, some of the very best pro-environmental strategies also have large payoffs in terms of future incomes. Investments in low-electricity appliances and low-energy transportation are likely to generate extremely high rates of return.<sup>66</sup> Countries with modern, high-speed rail systems, for example, can move people and goods at much lower costs and with much less environmental damage than in the United States, which continues to rely on a uniquely car-and-road-intensive approach to transportation.<sup>67</sup> Interestingly, even investments in improved roadways provide rates of return that allow them to pay for themselves, even if they are financed by

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<sup>64</sup> See Stephen J. DeCanio, *Economic Modeling and the False Tradeoff Between Environmental Protection and Economic Growth*, CONTEMP. ECON. POL'Y, Oct. 1997, at 10, 23 (1997).

<sup>65</sup> See DAVID ROLAND-HOLST & FREDRICH KAHRL, CLEAN ENERGY AND CLIMATE POLICIES LEAD TO ECONOMIC GROWTH IN THE UNITED STATES, available at [http://are.berkeley.edu/~dwrh/CERES\\_Web/Docs/EAGLE%20Fact%20Sheet%20on%20ACES.pdf](http://are.berkeley.edu/~dwrh/CERES_Web/Docs/EAGLE%20Fact%20Sheet%20on%20ACES.pdf).

<sup>66</sup> See PEW CTR. ON GLOBAL CLIMATE CHANGE, RESIDENTIAL END-USE EFFICIENCY 1 (2009), available at [http://www.pewclimate.org/docUploads/Residential%20End-Use%20Efficiency%20final\\_0.pdf](http://www.pewclimate.org/docUploads/Residential%20End-Use%20Efficiency%20final_0.pdf) ("When considering costs over the lifetime of an investment, end-use energy efficiency can be one of the lowest-cost means of meeting energy demand and of reducing GHG emissions.").

<sup>67</sup> See Edward L. Glaeser, *How Big Are the Environmental Benefits of High-Speed Rail?*, N.Y. TIMES ECONOMIX BLOG (Aug. 12, 2009), <http://economix.blogs.nytimes.com/2009/08/12/how-big-are-the-environmental-benefits-of-high-speed-rail/>.

deficit spending today.<sup>68</sup> More modern forms of transportation, however, provide an even higher rate of return on investment.

This is one of the reasons that recent proposals to create, for example, an “infrastructure bank”<sup>69</sup> to finance such long-term spending projects—as President Obama has recently suggested—can be somewhat problematic, since such financing might be used to finance investments that are both ecologically damaging and less wealth-inducing than the greener alternatives. When assessing environmental legislation and its impact on future generations, however, the point is simply that there are both large- and small-scale projects available that would make the world inhabited by future people both richer and healthier.

In other words, the benefits of pro-environmental legislation accrue to future generations, whereas the costs can be borne either by future generations (in the form of lower incomes) or by current generations (in the form of lower consumption). The latter strategy is less arrogant in one sense, because it does not require those currently alive to claim to know how future generations would trade off their own income *versus* their own environmental benefits. It would still, however, run the risk of being an exercise by which one generation sacrifices in order to bestow a gift on future generations, not knowing if the recipients of the gift would put any value on what they received. Either way, the problem remains that current generations can only guess at the preferences of humans who will be born into quite different worlds.

Finally, it is essential to return to the question of distribution—of rich and poor. The analysis above has, with small exceptions, ignored questions of the distributive impact of environmental legislation. If, however, an otherwise promising pro-environmental policy would result in reduced incomes for the lowest-income people (today or in the future), or if the policy would generate future benefits that would not be felt by the lowest-income people alive in the future, then there are two possible responses: We can either choose the next-best environmental policy that does not have the regressive redistributive effect, or we must compensate the lowest-income people for bearing a disproportionate burden of the policy. Otherwise, such policies would amount to a twist on the concept of “environmental racism,” which usually describes the direct infliction of environmental harms on poor neighborhoods.<sup>70</sup> Similarly, it

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<sup>68</sup> See Robert H. Frank, *Let's Start Spending*, DAILY BEAST (July 20, 2010, 11:12 PM), <http://www.thedailybeast.com/blogs-and-stories/2010-07-20/spending-cuts-would-deepen-our-debt/> (“Spending \$1 now on road maintenance thus keeps us from having to spend \$2 three years from now.”).

<sup>69</sup> Sheryl Gay Stolberg & Mary Williams Walsh, *Obama Offers a Transit Plan to Create Jobs*, N.Y. TIMES, Sept. 7, 2010, at A1.

<sup>70</sup> See *Environmental Justice: Hearings Before the Subcomm. on Civil & Constitutional Rights of the H. Comm. on the Judiciary*, 103d Cong. 4 (testimony of Dr. Benjamin F. Chavis, Jr., Executive Director, United Church of Christ, Commission for Racial Justice); Kent Jeffreys, *Environmental Racism: A Skeptic's View*, 9 ST. JOHN'S J. LEGAL COMMENT. 677, 679 (1994).

is essential to guarantee that the less well-off members of society do not pay for environmental policies that benefit their richer counterparts.

This is especially important because, even independent of environmental issues, redistribution should again become an important goal of economic policy in the United States and elsewhere. Redistributive policies more generally do not implicate the environment and they are often growth-inducing. In any case, however, environmental policies should not generate even greater inequality than already exists in the increasingly stratified U.S. economy.

## V. CONCLUSION

Justice between generations presents an especially difficult set of moral questions. There is, as yet, no definitive philosophical argument supporting the idea that each generation *must* take into account the interests of generations yet to come. This means that each generation could, if it wanted to, simply ignore the interests of other generations, acting in ways that might even prevent future generations from ever coming into existence.

For the current generation to make such a decision, however, and to do so in a way that is not a matter of simple selfishness on the part of those who are already comfortable, the choice to ignore future generations must be justified by improvements in the lives of people in need. The only non-selfish reason to ignore the interests of future generations, therefore, would be that doing so allowed current generations to try to ameliorate the plight of currently miserable people. For current generations to continue to ignore the most vulnerable among those alive, while also harming the health and well-being of future people, would be the height of arrogance and selfishness.

Current generations claim to care about the welfare of unknown future generations. If not, there could be no justification for the misery that is the lot of so many living people. This is not, therefore, an argument about whether it is right to choose to bring future generations into existence, but about the moral implications of that choice. Having chosen to bring them into existence, current generations owe their heirs their best guess of what kind of environment and economy they would like to inherit. Certainly, therefore, environmental policies aimed at addressing existential threats to life on this planet must be given primacy, notwithstanding their possible impacts on the incomes of future generations.

In less extreme cases, happily, the classic trade-off between the environment and the economy is neither as inevitable nor as large as is often assumed. Moreover, because the path of future incomes is so promising, many pro-environmental policies that would result in a slight decrease in future incomes are easier to justify than if future incomes were not likely to be so high. Also, many policies that involve sacrifices today have double benefits in the future, as they will lead both to higher

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incomes and a more livable environment. These policies should be pursued by any generation that believes that it owes future generations a meaningfully better life—always bearing in mind that the costs and benefits of such policies can, if they are not carefully designed, redistribute society's costs and benefits from the poorest to the richest. Intergenerational justice without distributive justice is not justice at all.