

*The Public and Private Morality
of Climate Change*

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We as individuals are subject to various moral duties. We have a duty to be kind to strangers, to keep our promises, to look after our parents when they are old, and so on. Collective entities, including our governments, are also subject to moral duties, or so I assume. I assume that a government should not imprison innocent people, it should protect refugees, it should support the destitute, and so on, and that these are moral duties.

The moral duties of governments—whatever they are—I call “public morality.” They generate derivative moral duties for citizens: we should do what is appropriate to get our government to act rightly, and support it when it does. These duties I call “civic morality.” By “private morality,” I mean the morality of our private lives; private morality does not include our civic duties.

Climate change creates duties within both public and private morality. I shall describe some of them.

DUTIES OF JUSTICE AND DUTIES OF GOODNESS

Moral duties fall into two broad classes: duties of justice and duties of goodness or beneficence. There may be other sorts of moral duties, too, but I shall be concerned only with these two. I start by making the distinction between them.

The duty of goodness is to make the world better. Some libertarians deny that people as individuals have this duty. I disagree with those libertarians, but I have no need to argue with them here. My conclusions about private morality will not call on this duty of goodness. However, I shall assume that governments have a duty of goodness; I assume they have a duty to make the world better for their own citizens at least. For instance, they should create their country’s economic infrastructure and design their banking regulations with that aim in mind.

Improving the world is not our only moral duty. When an action of yours would improve the world, you are not necessarily morally required to do it, and sometimes you are not even morally permitted to do it. A famous example is the case of a surgeon who has five patients, each needing an organ in order to survive: one needs a heart, another a liver, a third a kidney, and so on. Suppose the surgeon kills an innocent visitor to the hospital and distributes her organs to the five patients, thereby saving five lives at the expense of one. That leads to a net benefit; it improves the world. Yet this surgeon’s act is not morally permissible.

So there must be some other source of moral duties that can oppose the duty of goodness. There is evidently some sort of a moral duty not

to harm people, even for the sake of the greater overall good. This is not merely a duty to take account of as a harm, as a negative good, in the course of performing your duty to improve the world. If it were, the surgeon I described would not be acting wrongly, whereas actually she is. On the other hand, the duty not to harm is not unlimited; there are occasions when it is morally permissible to harm someone. For instance, you may do harm in self-defense, and you may harm a person when you are inflicting a deserved punishment on her. I am sorry to say I cannot accurately delineate the boundaries of the duty not to harm, but I hope soon to identify one instance of it convincingly.

I take this duty not to harm to be a duty of justice. Other philosophers may classify it differently, and nothing will turn on the classification. It does have at least one feature that is characteristic of justice. It is a duty *owed* to a particular person, or to particular people. If you breach a duty of justice, you are doing an injustice, and there is always someone to whom you do it. To express this fact, we often say that the person has a *right* to your performing the duty. Rights go along with justice. When you have a duty of justice to do something, someone has a right to your doing it.

By contrast, duties of goodness are not owed to particular people. The difference is nicely illustrated by the views of the eighteenth-century philosopher William Godwin. Godwin thought that the duty to promote good is indeed owed to the people whose good you should promote.¹ He explicitly classified it as a duty of justice. For instance, he thought that if someone else can make better use of your horse than you can, she has a right to it. He thought you do her an injustice if you do not let her have it. Few of us agree with Godwin about that. Most of us think we have a duty to promote goodness, but we think the duty is not owed to particular people, and we therefore do not take it to be a duty of justice.

JUSTICE AND GOODNESS IN PUBLIC AND PRIVATE MORALITY

I am now going to apply this distinction among sorts of duty to the moral duties that arise from climate change. My first point is that the relative importance of justice and goodness differs between private morality and public morality. Justice is relatively more important for private morality, goodness relatively more important for public morality. Indeed, I shall

1. William Godwin, *Enquiry Concerning Political Justice*, 3rd ed. (1798; reprint, Harmondsworth: Penguin Press, 1976).

argue that the private morality of climate change is governed entirely by the duty of justice, whereas public morality is also aimed at goodness.

Why do I say this? For two main reasons. The first is known as the “nonidentity problem.” It was made prominent by the philosopher Derek Parfit.² Remember that a duty of justice is owed to particular people, who have a right to its performance. Take a particular person who is alive 150 years from now—call her “Sarah.” Suppose Sarah’s life is not very good because we, the current generation, allow climate change to go unchecked. Could she claim we do her an injustice by our profligacy? Could she say she has a right to a better life, which we deny her by emitting so much greenhouse gas? She could not, for a reason I shall now explain.

Suppose we were instead to take the trouble to reduce our emissions. By “we” I am referring to the present generation either in the whole world or within a particular nation. We would live lives of a different sort. The richer among us would travel less by car and plane and buy fewer consumer goods. The poorer would find farming easier and find less need to migrate to the cities; they would also find less need to move to higher ground to escape from the rising sea. There would be many other differences. Indeed, everyone’s life would be different. Consequently, many people would have babies with different partners. Even those who would have the same partner as they actually do have would conceive their babies at different times.

The identity of a person depends on the sperm and egg she originates from. No one could have come from a different egg or a different sperm from the one she actually does come from. To put it differently: anyone who originated from a different sperm or a different egg would be a different person. Consequently, even the slightest variation in the timing of conception makes a different person. A slight change in a couple’s lives means that they conceive different people. Were we to significantly reduce our emissions of greenhouse gas, it would change the lives of nearly everyone in the world. Within a couple of generations, the entire population of the world would consist of different people. Call this the “nonidentity effect.”

Our Sarah would therefore not exist at all, were we to take the trouble to reduce our emissions. If she would not even exist were we to reduce

2. Derek Parfit, *Reasons and Persons* (Oxford: Oxford University Press, 1984), chap. 16. I think it was Douglas MacLean who brought me to see the importance of it for justice in particular, in his “A Moral Requirement for Energy Policy,” in *Energy and the Future*, edited by Douglas MacLean and Peter G. Brown (Totowa, NJ: Rowman and Littlefield, 1983), 180–97.

our emissions, she cannot plausibly claim she had a right to a better life, which we violate by not doing so. We could not give Sarah a better life by emitting less gas, so we do not violate a right of hers by emitting profligately. Suppose we did owe a duty to Sarah to reduce emissions. Were we to carry out this duty, there would be no Sarah and therefore no duty. It would be a duty that cannot be satisfied. That makes no sense. We can conclude that our emissions do no injustice to Sarah. The same goes for nearly everyone in her generation.

In a way, the nonidentity effect excuses us as a generation from a charge of injustice toward future generations. Please do not think it excuses us from every moral duty to reduce emissions. Our continued emissions make the lives of future generations much less good than they could be. So they constitute a serious violation of our duty of goodness. This is not in any way a minor violation of morality; making the world less good is a serious moral fault. But it is not a violation of justice.

The nonidentity effect of a generation's or a country's emissions will obviously be much bigger than the nonidentity effect of a single person's emissions. If you reduce your own emissions of greenhouse gas, that will affect the identity of some people in the next few generations, but probably not very many. So the nonidentity effect provides individuals with little excuse against a charge of injustice to future generations. That is the first reason justice is relatively more important for individuals than it is for nations and their governments.

THE HARM DONE BY AN INDIVIDUAL

The second reason justice is relatively more important in the private morality of climate change is that the duty of goodness demands very little of an individual. It requires you to reduce your greenhouse gas emissions only insofar as you can do so at a very small cost. Probably it requires you to turn off the light when you leave a room—that sort of thing. The reason is quantitative, and to explain it I need to start by giving you some idea of the quantity of harm a person's emissions do.

I shall use a calculation shown to me by David Frame, now of Victoria University in New Zealand.³ I must emphasize that Frame means it to be very rough. The figures are intended only to show you the order of magnitude of the harm you do, nothing more. Frame calculates that an average person from a rich country, if she was born in 1950, will emit dur-

3. David Frame, "Personal and Intergenerational Carbon Footprints" (forthcoming).

ing the course of her whole life about 800 tonnes of carbon dioxide. This will warm the atmosphere by about half a billionth of a degree. A major part of the harm climate change will do is the killing of people. The World Health Organization has published predictions of the number who will be killed, and on that basis we can estimate that this 800 tonnes will shorten people's lives in total by some months. Each year of a rich person's emissions shortens lives by one or two days. We will not shorten any single person's life that much, but each of us shortens lives in total by that amount.

This is a serious harm. None of us would want to be responsible for shortening people's lives to that extent. This figure shows you, read conversely, how much good you could do by reducing your emissions. Some people despair in the face of climate change. They think the problem is so huge that nothing they can do as individuals will do any good. But they are wrong. By reducing your emissions, you can do significant good through extending people's lives. If you stop your emissions, each year you will extend lives by a day or two.

But the main point I want to make is that the good you can do by reducing your emissions, though significant, is small compared with other opportunities you have. Suppose you reduce your annual emissions to zero in the cheapest possible way (which is by offsetting them, as I shall explain later). It will cost you a few hundred dollars per year. For that you will extend people's lives by one or two days each year. But for a few hundred dollars, a charity that treats tuberculosis can cure a person's infection, and thereby extend her life for many years or decades. Of course, reducing emissions will do good in other ways as well as by saving lives, but they are not enough to close this very large gap in benefits. So if you aim to use your resources to improve the world, reducing emissions of greenhouse gas is not the way to do it. To improve the world, you should carry on emitting, and send the money you save by doing so to a tuberculosis charity. This is why I say that the duty of goodness does not require you to reduce your emissions significantly.

Why does the same argument not apply to governments? It's because governments—at least the governments of large countries—control more resources. Like individuals, they have more effective ways of using resources to do good, by treating tuberculosis, controlling malaria and polio, providing clean drinking water around the world, and so on. But even if they were to do all those things, they could *still* improve the world further by using their power to reduce greenhouse gas emissions.

A government's duty of goodness requires it to treat tuberculosis, control malaria, provide clean water, and so on, *and* control climate change. That is not so for an individual. If you were to devote all your resources to improving the world, even when they were completely exhausted, the need for tuberculosis treatment would still be more pressing than the need to reduce greenhouse gas emissions.

THE INJUSTICE OF EMISSIONS

The private morality of climate change therefore does not arise from the duty of goodness. It arises instead from the duty of justice. What justice does justice require of individuals?

I am concerned with the particular duty of justice not to harm. I have already said that each person's emissions of greenhouse gas do harm. I have even given a rough estimate of the amount of one particular harm they do: the harm of shortening lives. Earlier I pointed out that not all harms are necessarily unjust, but next I shall argue that the harm done by emissions is indeed an injustice. I cannot do this conclusively, because I am not able to identify exactly where the boundary lies between harms that are unjust and those that are not. But I shall mention seven different characteristics of the harm done by our emissions, and by the time I have reached the end of the list, I think it will be clear that this harm lies on the side of injustice. Several points beside the seven are so obvious that I do not include them in the list: the harm caused by emissions is not a merited punishment, it is done without the consent of the person harmed, and so on. Here is the list.

First, the harm done by our emissions is the result of something we *do*. Many of us make a distinction between doing harm and failing to prevent harm. If you fail to donate to a charity that relieves poverty, you fail to prevent the harm of poverty, but many of us do not think this failure is an injustice. Emitting greenhouse gas is different. In living our lives, we *act* in ways that cause greenhouse gases to be emitted. We *cause* carbon dioxide to spew from our chimneys and the exhaust pipes of our cars. These are consequences of things we do, rather than of things we omit to do.

Second, the harm we do by our emissions is serious. It may be permissible to do a trivial amount of harm, but this harm is far from trivial. I have given an idea of its size.

Third, the harm we do is not accidental. Indeed, we do it knowingly, though not deliberately. Few people in the developed world are ignorant

of the greenhouse effect. Accidental harms are not an injustice, but emissions are not in that category.

Fourth, we do not compensate the victims of our harm. An injustice can sometimes be canceled by compensation, but our emissions are not canceled in this way.

Fifth, most of us make our emissions for our own benefit. That is not true of all of us. Some people are exceptionally altruistic and act for the sake of others. They may use the money they save by not cutting their emissions to benefit mankind. I am addressing not them, but the less altruistic majority. I said that justice normally prohibits you from harming other people even in order to make the world better. It more strongly prohibits you from harming other people in order to benefit yourself.

Sixth, the harms done by the emissions of the rich are not fully reciprocated. Some environmental harms are reciprocal. Traffic congestion is an example. If you drive to work, the presence of your car on the roads impedes other people on their way to work. They equally impede you. Each of you is significantly harming others by delaying them, but because the harm is reciprocal, we do not think that each of you is doing an injustice to others. Climate change is different. It is mostly a one-way transaction in which the present rich harm the present poor and future generations and are not much harmed in return. When I say that greenhouse gas emissions are an injustice, I am referring to the emissions of the present rich.

A seventh characteristic of greenhouse gas emissions is that we could easily reduce them. I shall soon explain that this is easier than you may think. You might be excused for causing harms that it would be very hard to avoid causing, but emitting greenhouse gas is not in that category.

I conclude from all these considerations that our emissions of greenhouse gas are an injustice.

THE INDIVIDUAL DUTY NOT TO CAUSE EMISSIONS

It follows that each of us is under a duty of justice not to cause the emission of greenhouse gas, at least without compensating the people who are harmed as a result. Your carbon footprint ought to be zero unless you make restitution. This is strong advice, but I find I cannot avoid drawing this conclusion. It puts me in a unusual position for a moral philosopher. Normally, moral philosophers talk in generalities. We avoid preaching to people about particular moral demands. But here I am doing that.

Fortunately, you will see in a moment that this duty turns out to be less onerous than it may at first appear.

By what means should you perform this duty of justice? You might try to do it by compensating the people you harm. Doing so would be remarkably cheap. Most of the harm you cause will not happen till far in the future. This means that if you put aside money now to compensate the victims of your harm, you can exploit the power of compound interest before you have to pay it over. William Nordhaus calculates that if you are lucky enough to be able to invest your money at 5.5 percent per year, \$7.40 is enough to compensate for the harm done by a tonne of carbon dioxide.⁴ Since you emit perhaps twenty or thirty tonnes in a year, a couple of hundred dollars a year will suffice.

However, I do not recommend this means of trying to achieve justice, because it will fail. Remember that duties of justice are owed to particular people. Your emissions of greenhouse gas are an injustice done to a large fraction of the world's population over a long period of time. You will not be able to compensate each of them individually.

You might try to make restitution through a collective international scheme of some sort. That way, you will not compensate all the individuals you harm, but you might manage some sort of surrogate compensation, by compensating large populations rather than individuals. Possibly you might satisfy justice by other means. But there remains another problem. You do not know how much compensation you actually owe. None of us knows how much harm we cause by our emissions. We may be able to compute how much gas we emit, but the harm that gas does is very uncertain. Predictions of the effects of climate change are recognized to be very uncertain indeed. I have mentioned Nordhaus's figure, but I do not think he would claim it is particularly reliable.

You would do much better not to make the emissions in the first place; no compensation will then be required. This is possible. We all know some steps we might take: do not live wastefully, be frugal with energy in particular, switch off lights, do not waste water, eat less meat, eat local food, and so on. Many of these are steps you can take at little or no cost to yourself, and you should take those ones. However, you could not live in a way that does not cause the emission of any greenhouse gas at all. Virtually anything you buy has been produced using energy from

4. William Nordhaus, *A Question of Balance* (New Haven, CT: Yale University Press, 2008), 15, 178.

fossil fuels. You can certainly reduce your emissions. But your most effective way of reducing your emissions to zero is to cancel or *offset* the emissions that you will still be causing after you have taken the obvious steps. Offsetting is a good way to fulfill your duty of justice. I shall explain how it works in a moment.

I am not telling you that offsetting is a way to solve the problem of climate change. I have already said that reducing your individual emissions of greenhouse gas—by offsetting or in other ways—is not the most effective way for you to improve the world. Your duty to have a zero carbon footprint does not derive from your duty of goodness. You must do it to avoid committing an injustice to other people—simply that. So far as solving the problem of climate change is concerned, your best route is through political action to induce your government to do what it should.

OFFSETTING

Offsetting your emissions means ensuring that for every unit of greenhouse gas you cause to be added to the atmosphere, you also cause a unit to be subtracted from it. If you offset, on balance you add nothing. Offsetting does not remove the very molecules that you emit, but the climate does not care which particular molecules are warming it. If you offset all your emissions, you make sure that your presence in the world causes no addition to the greenhouse gas in the atmosphere. You do not contribute to warming the atmosphere, so you do no harm through climate change. It is not that you do harm, which you then compensate for; offsetting is not a sort of compensation. It is a way to avoid harming in the first place.

It will not be easy to calculate the offset you need. You must make sure you offset not just the gas that is directly emitted by your own actions, but also the gas that supplied the energy used in making everything you consume. The average emissions in your own country will not be a good guide, because much of what you consume will have been manufactured abroad. It would be safest to overestimate. But in any case, this calculation is much less pervaded by uncertainty than trying to calculate how much harm your emissions do, with the aim of compensating people for them. This adds to the reasons for preferring offsetting to compensating.

How do you offset in practice? You may be able to subtract gas from the atmosphere yourself. One way of doing so is to grow trees. As they grow, trees remove carbon from the air to build their bodies: they take in carbon dioxide molecules, keep the carbon, and release the oxygen. But you would need to make sure that your trees' carbon is permanently kept

out of the air, and that would be hard to achieve. Eventually, your trees will die and decompose, and their carbon will return to the air. Somehow you will have to ensure your forest will be replanted again and again perpetually even after your death. For that reason, effective do-it-yourself offsetting is difficult.

More easily practicable means of offsetting are “preventive,” as I call them. Instead of taking carbon dioxide out of the atmosphere, they prevent it from getting into the atmosphere in the first place.

Plenty of commercial organizations offer to prevent carbon emissions on your behalf. You pay them a fee per tonne of offsetting you ask them to do. They use your money to finance projects that diminish emissions somewhere in the world. Most projects create sources of renewable energy. For instance, they build hydroelectric power stations or wind farms. Others promote the efficient use of energy. One installs efficient cooking stoves in people’s homes in Africa and Asia. Cooking with firewood is an important cause of carbon emissions, and efficient stoves reduce the quantity that is emitted.

Preventive offsetting is cheap. Responsible companies will offset a tonne of emissions for around ten dollars. This means you can offset all your emissions for a few hundred dollars. That is why I said you can easily avoid harming people through your emissions.

Many environmentalists are strongly opposed to offsetting. Greenpeace is opposed, for example. One of its arguments is: “The truth is, once you’ve put a tonne of CO₂ into the atmosphere, there’s nothing off-setting can do to stop it changing our climate.”⁵ I do not think this is true. If at the same time you put a tonne of carbon dioxide into the atmosphere, you subtract another tonne, your actions together do not change the climate. So, since the climate does not change, the tonne you emit does not change it. Certainly, *you* do not change the climate, which is what matters.

Still, I recognize there are significant moral and practical problems connected with offsetting. One of them is that it is difficult to be sure that the reduction in emissions you pay for really happens. But I prefer to leave these for our discussion, because I want to get on to public morality.

GOVERNMENTS’ DUTIES OF GOODNESS

Governments, like individuals, bear duties of justice. However, in responding to climate change, they also have duties of goodness. I am going to

5. Statement by Charlie Kronick of Greenpeace, January 17, 2007.

concentrate on those because I have already talked about justice. I want to survey a different part of the morality of climate change.

When governments try to promote goodness, they must generally do some complex calculations. Their actions, especially over climate change, benefit many people and also impose costs on many people. Different benefits have to be aggregated together somehow, and so do different costs. Then benefits have to be weighed against costs. Cost-benefit analysis of some sort is inevitable. Climate change is a problem on a vast scale, affecting the whole world for centuries, and the quantitative methods of economics are necessary for coping with it.

Cost-benefit analysis also calls for ethical analysis, because the valuing and weighing of benefits and costs raise moral questions of many sorts. How should benefits to the rich be weighed against benefits to the poor? How should we value the loss of a person's life against the mundane good things that life contains? How should we take account of the huge uncertainty that surrounds climate change, including the small chance of total catastrophe? How should we weigh distant future benefits against present costs? How should we take into account the changes in the world's population that climate change will undoubtedly cause, including the small chance that our population will collapse to small numbers or even to extinction?

EFFICIENCY

All of those questions are fertile sources of disagreement and argument. But I have decided to leave them aside and take up one subject that does not involve weighing and aggregating. Instead, it involves what economists call efficiency. Having spent most of this lecture talking about private duties of justice that particularly do not aim to solve the problem of climate change, I am going to spend the rest of it on something that perhaps might solve it. It is a point that I have come to think is extremely important for the practical politics of climate change.

Oddly enough, it is a point of simple economics. When a person engages in some activity that emits greenhouse gas, the gas spreads around the globe and delivers small harms everywhere. These harms are among the costs of what the person does, but the person who causes the gas to be emitted does not bear this cost. It is borne by all people who suffer the harm. In economists' terminology, it is an "external cost" of the activity. Emissions of greenhouse gas constitute an "externality," as economists put it.

Externalities cause *inefficiency*. From the point of view of economics, this is what principally makes climate change a problem. Inefficiency here is what is sometimes called more specifically “Pareto inefficiency.” It is defined as a situation in which it would be technically possible to make some people better off without making anyone worse off; a change of this sort is called a “Pareto improvement.” Because emissions are an externality, they cause inefficiency in this sense, so a Pareto improvement is possible. I can go further. It would be technically possible to go so far as to remove the externality through a Pareto improvement.

This is a consequence of very elementary economic theory, though I admit I had to be reminded of its implications for climate change by my onetime teacher Duncan Foley.⁶ The elementary economics needs to be modified to take account of the nonidentity effect, but it is nevertheless true that no one needs to make any sacrifice to solve the problem caused by the externality of greenhouse gas emissions.

I can describe in broad terms how the externality could be solved without any sacrifices. Although we are bequeathing to our successors a dirty atmosphere, we are doing quite a lot of good things for them in other ways. We are leaving them a lot of resources: cities, economic infrastructure, cultivated land, knowledge, and also those natural resources that we do not use up. Suppose we reduce our emissions of greenhouse gas. Other things being equal, that would require a sacrifice on our part. But we could fully compensate ourselves for the sacrifice by consuming more of other resources and leaving less to future generations in other ways. We could compensate ourselves to the extent that we are no worse off on balance. In macroeconomic terms, we could keep our own consumption constant and redirect our investment toward reducing greenhouse gas emissions. Future generations would receive from us fewer resources of other sorts, but they would have a cleaner atmosphere, and they would end up better off on balance.

Here is a slightly more concrete example of how this could be done. We could impose a carbon tax equal to the external damage done by emissions. Then we could compensate each person in some way for the carbon tax she pays. For example, we could reduce her income tax to the extent that she is just as well off as she was before. The carbon tax itself would finance some of the compensation, but it will not be enough to finance

6. See Duncan Foley, “The Economic Fundamentals of Global Warming,” in *Twenty-First Century Macroeconomics: Responding to the Climate Challenge*, edited by Jonathan M. Harris and Neva R. Goodwin (Cheltenham, UK: Edward Elgar, 2009), 115–26.

full compensation for everybody. The balance could be financed by a loan that will be repaid by future generations.

The externality of climate change could be removed without anyone's making a sacrifice. This raises a puzzle. When delegates come each year to meetings of the United Nations Framework Convention on Climate Change, at Copenhagen or Durban or somewhere else, they take themselves to be negotiating about how to distribute among the nations the burden of reducing climate change. No government will agree to accept a burden—to impose a sacrifice on its people—so the meetings regularly fail to achieve the reductions in emissions that are required. Yet I am saying that eliminating the problem of climate change requires no sacrifices at all. What is going on?

EFFICIENCY VERSUS OPTIMIZATION

I am telling the truth. It would indeed be possible in principle to eliminate the externality without any sacrifices. Doing so would be an improvement on the present situation, since some people would be better off and no one would be worse off. But it does not follow that this is the best thing that can be done about climate change. Most of the economists who work on climate change have chosen to look for this best thing, and their thinking has influenced the political process. These economists approach the problem as one of *optimization*. They look for the *best* way of managing our resources: the way that will do the most good. They work out how the international community can best meet its duty of goodness. This involves weighing benefits and costs in the way I have described. It turns out that, if their calculations are correct and founded on correct ethical principles, it would be best if the present generation did make some sacrifices for the future. This is the conclusion of the *Stern Review*, and William Nordhaus agrees, though he thinks there should be much less sacrifice than Stern does.⁷

Compare these three options:

Business as usual. (“BAU”)

Reduce emissions and fully compensate ourselves for doing so, so there is no sacrifice. (“Compensation”)

Reduce emissions and do not fully compensate ourselves for doing so, so there is sacrifice. (“Optimum”)

7. Nicholas Stern et al., *The Economics of Climate Change: The Stern Review* (Cambridge: Cambridge University Press, 2007). A remark by William Nordhaus on page 180 of *A Question of Balance* implies agreement.

We are told that Optimum is better than Compensation, which is better than BAU.

The diagram illustrates the options in the stylized form that will be familiar to economists. The black curve labeled “possibility frontier” encloses all possible distributions of consumption between present and future generations. Because BAU is inefficient, it lies below this curve. Compensation lies on the frontier northeast of BAU. This means it gives more consumption to each generation than BAU does; it is a Pareto improvement over BAU. There are in fact many points on the frontier that are Pareto improvements over BAU; I have picked one arbitrarily. The diagram also shows two versions of Optimum. “Stern’s Optimum” is the point of the frontier that is best according to the values embodied in the *Stern Review*, which give substantial weight to the consumption of future generations. “Nordhaus’s Optimum” is the best point according to values espoused by William Nordhaus, which weight future generations’ consumption less heavily.

Compensation is unattractive. Not only is it worse than Optimum, but it also incorporates injustice. BAU is an unjust situation: the present rich harm the present poor by our emissions of greenhouse gas, and that is unjust. If we move from there to Compensation, the rich are paid for reducing their emissions by those who suffer from them. This is an improvement for those who suffer, but it nevertheless perpetuates the injustice. If someone unjustly hurts you every day, you may be able to improve your situation by paying her to stop it, but that does not remove the injustice.

So I understand why the political process aims toward Optimum rather than Compensation. But the constant failure of the political process has made me cynical. National leaders will not commit their presently living people—in most cases their electorate—to the sacrifices they must make to achieve Optimum. I no longer think Optimum can be reached through negotiation, and I now favor aiming instead at Compensation. The issue at stake would then be how to distribute the *benefits* of controlling climate change—not the burdens—among the nations. Putting the question in this optimistic form might break the political logjam.

The difference between Compensation and Optimum is a matter of the distribution of resources between people: between the rich and the poor and between present and future generations. This distribution is not primarily determined by climate change, and dealing with climate change

need not involve putting it right.⁸ If you aim for the very best outcome, you are aiming to correct all the present ills of the world. For example, suppose you think that the correct rate for discounting future commodities is below the interest rate in the market. By implication, you think the market does not pass as many resources to the future as it should; present people are consuming too much and not leaving enough for our successors. If, in dealing with climate change, you choose policies that are optimal according to your lower discount rate, you will find yourself making up for this general failure, as well as for the particular problem of climate change. Now that I have become cynical, I think we should concentrate on solving the particular problem and temporarily leave aside the general one.

PUBLIC MORALITY

Should we understand this as a moral duty of goodness, resting on governments and the international community? It could be argued that promoting efficiency is not even a moral duty at all. It is in everyone's interests. We could think of this task of government as merely one of coordinating people's activities in pursuing their own interests. We might even think a government in this domain acts not as an agent in its own right, but as a mere mechanism through which individual people coordinate their activities by mutual agreement. Many economists claim that ethics has nothing to do with economics, and many of those same economists claim that economics is concerned with efficiency only. I think this idea may be the basis of their thinking.

But governments have too many of the characteristics of agency for this to be plausible. For example, governments clearly have intentions. After two centuries, the Monroe Doctrine still expresses one of the US government's intentions, even though the personnel who constitute the government have changed many times. True, it remains a topic for philosophical research how a collective entity can have intentions, but it is a fact. As agents, governments are potentially bearers of moral duties, and improving the world is one duty they actually bear. Moreover, they cannot be merely a forum where agents coordinate their interests, since many of the relevant interests belong to people who are not yet born. Governments have a moral responsibility toward those people.

8. Here I agree with Eric Posner and David Weisbach in *Climate Change Justice* (Princeton, NJ: Princeton University Press, 2010).

If governments cannot achieve the best outcome, Optimum, their duty of goodness requires them at least to aim for Compensation.

This sets a task for the economics profession. The theory tells us that Compensation, where no one makes a sacrifice, is possible. But to make it possible in practice requires some work. We are to reduce our emissions, financing the cost of doing so by loans that will be repaid by future people. But we know well that there is a limit to the amount that governments can borrow, and several governments seem to have already reached their limit. We therefore need new economic institutions that are robust enough to support enough borrowing to achieve Compensation. Economists must design these institutions.

I hope institutions can be created that will make Compensation possible. If so, I hope it will allow progress to be made on climate change. But remember that Compensation is not a good solution. If Compensation can be achieved, Optimum still remains a possibility. Getting from Compensation to Optimum is a matter of the distribution of resources between generations. It could be achieved by canceling the debt that builds up under Compensation. I hope that by making Compensation a real possibility, we might achieve something more like Optimum in the end. In taking the cynical position, I have not abandoned the aim of doing the best.