

SYMPOSIUM
A CHANGING MORAL CLIMATE



EDITORIAL PREFACE

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Editorial Preface

Most contemporary philosophers recognize the unprecedented challenges that the phenomenon of climate change poses to our moral intuitions, our moral and political systems, our motivational springs, and our economic and legal paradigms. Some have attempted to provide comprehensive diagnoses of these challenges and to suggest conceptual angles from which to approach them. Most of the work produced by philosophers on various aspects of climate change (e.g. personal and institutional responsibility, justice, the claims of future generations, the fate of non-human nature, worst case scenarios, possible responses, the proper role of science) have been as stimulating as they have proven controversial. There is a growing and rich discussion on the topic, which this special volume of *Philosophy and Public Issues* wants to capture and disclose.

In the first part of the volume, Stephen Gardiner presents his recent *A Perfect Moral Storm: The Ethical Tragedy of Climate Change* (Oxford: Oxford University Press 2012), addressing questions by Rory Smead, Ronald Sandler, Christopher J. Presto, Dale Jamieson, Marcello di Paola and Gianfranco Pellgrino. In the second part, we host five papers critically engaging with

contemporary theories on the ethics climate change and effect of global warming for political philosophy.

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THE HEART OF
A PERFECT MORAL STORM

A PRÉCIS BY STEPHEN GARDINER

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The Heart of *A Perfect Moral Storm*

Stephen Gardiner

A *Perfect Moral Storm* is a long book, and contains extended discussions of many issues. It is therefore difficult to summarize without losing much of its content. In this brief Précis, I provide a broad overview of the basic message of the book, and then highlight some key parts that may be of particular interest to some readers.¹

I

The Central Message

Sometimes the best way to make progress on a problem is to get clearer on what that problem is. Arguably, the biggest issue facing humanity at the moment is the looming global

¹ Some of this material also appears in Stephen M. Gardiner, “The Ethical Dimension of Tackling Climate Change,” *Yale Environment* 360 (2011). Available at: http://e360.yale.edu/feature/the_ethical_dimension_of_tackling_climate_change/2456/

environmental crisis. Here, the problem is not that we are unaware that trouble is coming. The basic science is both well-known, and continually being reiterated in major national and international reports. Instead, the core problem is that thus far effective action seems beyond us. We seem at best paralyzed, and at worst indifferent. Put starkly, there seems little place within our grand institutions and busy lives for what may turn out to be the defining issue of our generation.

In my view, a central part of the explanation for this is the fact that humanity is in the grip of a profound ethical challenge that our current institutions and theories are ill-equipped to meet. Sebastian Junger's book *The Perfect Storm* tells the story of a fishing boat caught at sea during the rare convergence of three independently powerful storms. Similarly, the global environmental crisis brings together three major challenges to ethical action, and in a mutually reinforcing way. Climate change is a paradigm example. It is genuinely global, profoundly intergenerational, and occurs in a setting where we lack robust theory and institutions to guide us. Neglect of this perfect moral storm leads us to underestimate the climate problem and fail to appreciate the wider implications in predictable ways.

Conventional wisdom (especially in the most influential arenas of environmental policy, international relations and economics) identifies climate change as primarily a global problem, and so emphasizes the spatial dispersion of causes and effects. Wherever they originate, emissions of the main greenhouse gas (carbon dioxide) quickly become mixed in the atmosphere, affecting climate everywhere. According to the standard analysis, this makes climate change a traditional tragedy of the commons, played out between nation states that (it is tacitly assumed) represent the interests of their citizens in perpetuity. In Garrett Hardin's tragedy, each herdsman prefers the collective outcome

where none overconsume, so that the commons is not overburdened. Nevertheless, when acting individually each prefers to overconsume himself, no matter what the others do, with ruinous results for all. In climate change, we are often told, states reason in the same way. Each prefers the collective outcome where none overconsume carbon emissions—so that dangerous climate change is avoided. Yet, when acting individually, each prefers to overconsume, no matter what the others do—so overconsumption is rife. In both cases, then, we are led to an outcome that no one wants, and which is severe enough to be called tragic.

Unfortunately, this traditional model is at best dangerously incomplete. To begin with, it ignores one central spatial aspect of the climate problem. Those least responsible for past emissions are likely to suffer the most serious impacts (at least in the short- to medium-term). This is partly because the poorer nations are disproportionately located in more climate-sensitive regions, but it is also because, being poor, they lack the resources available to the rich to address negative impacts. Since it ignores this basic problem of fairness, the traditional model underestimates the nature of the relevant “tragedy.”

Even more importantly, the traditional model obscures the temporal aspect of the perfect moral storm. Once emitted, a substantial proportion of climate emissions typically remain in the atmosphere for hundreds of years, and some persist for tens—even hundreds—of thousands. This means that the current generation takes benefits now, but spreads the costs of its behavior far into the future. Worse, many of these benefits are comparatively modest (e.g., those of bigger and more powerful vehicles), and many of the projected costs are severe, even catastrophic (e.g., severe flooding and famine). Worse still, the problem is iterated: the same temptation to take modest benefits

now even in the face of severe costs to the future is repeated for subsequent generations as they come to hold the reins of power. Hence, there are compounded cumulative impacts further in the future, making catastrophe more likely. Worst of all, such impacts may eventually provoke the equivalent of an intergenerational arms race. Perhaps some future generations will face such appalling environmental conditions that they are entitled to emit more in self-defense, even foreseeing that this behavior makes matters even worse for their successors. And so it goes on.

The shape of the temporal storm suggests that, rather than a traditional tragedy of the commons played out between nation states, we face a problem that I call the *tyranny of the contemporary* played out between and across generations. One fault of the conventional wisdom is thus to misdiagnose the policy challenge, which it does largely by assuming it away through the tacit and undefended assumption that nation states can be relied upon to adequately represent the interests of future as well as current citizens. Thus, what is needed is a *conceptual paradigm shift* away from the traditional tragedy of the commons and towards the tyranny of the contemporary and the wider perfect moral storm. This is true not just for climate change, but also more widely.

One reason that a paradigm shift is important is that continued misdiagnosis is likely to lead to bad policy. The tyranny of the contemporary is harder to resolve than the traditional tragedy of the commons, and solutions to the latter do not automatically carry over. Moreover, the dominant contemporary institutions (such as the market and short-term election cycles) were not designed with it in mind, and indeed seem to positively encourage it. Thus, the tyranny of the contemporary poses a major challenge.

A third storm exacerbates the situation. Climate change brings together many areas in which our best theories are far from

robust, such as intergenerational ethics, global justice, scientific uncertainty, and humanity's relationship to nature. The problem here is not that we do not have any guidance at all. (For instance, the basic ethical intuition that imposing catastrophe on the future for the sake of modest benefits to ourselves is indefensible seems relatively secure.) Instead, the problem is that it is difficult to move beyond such basic intuitions, and that without the backing of robust theories we are too easily distracted by spurious counterarguments, especially from theories that have merits in other contexts, but fail to take the future seriously enough. For instance, some influential economists claim that the current generation is justified in moving slowly on climate change because future people will be richer due to economic growth, and so should pay more. However, when subject to critical scrutiny this argument quickly seems overly simplistic and complacent. Are we really entitled to *assume* that the future will be richer even in a climate catastrophe? Even if they are, why should they pay to clean up our mess?

This worry about distraction leads to a further important result. The intersection of the global, intergenerational and theoretical storms threatens to undermine the integrity of public discourse. We in the current generation—and especially the more affluent - are in a position to continue exploiting our strategic advantages (e.g., by taking modest benefits for ourselves that impose risks of catastrophe on future people). However, recognizing that we are doing so is morally uncomfortable. Better, then, to cover it up with clever but shallow arguments that distort public discussion, and solutions that do little to get at the core problems. After all, most of the victims are poorly placed to hold us to account - being very poor, not yet born, or nonhuman.

Unfortunately, there is ample evidence for both forms of corruption in the case of climate policy. On the one hand, public

discussion does seem distorted. Persistent extreme skepticism about climate science and the motives of scientists abounds, as does a determined focus on scientific, technological and narrowly economic questions.

On the other hand, despite some noble efforts, international climate policy has thus far yielded only a succession of “shadow solutions” to the climate problem: processes, proposals and agreements that pay lip service to wider ideals but ultimately deliver very little in the way of substance. For instance, by 1994 all major countries including the United States had ratified the United Nations Framework Convention on Climate Change, and so agreed to “protect the climate system for present and future generations.” However, global emissions are now up more than 40% since 1990. Similarly, in 2009 in Copenhagen the global community publicly committed itself to limiting global temperature rise to 2 degrees Celsius. However, it left the hard question of who should do what to a subsequent national pledge system that does not get close to that target, and few have any confidence will actually be implemented. Moreover, the negotiations since Copenhagen have largely continued this pattern.² Alas, given the temptations of the global and intergenerational storms, such dithering is all too predictable, and highly convenient.

As bad as this news is, there may be worse to come. A buck-passing strategy need not limit itself merely to inaction and distraction, but rather should be expected to evolve over time. Given this, as the overall situation worsens, we might predict that the current generation will begin to press for a quick technological fix to hold off the worst impacts, at least until after

² We see headlines such as “Cancún deal leaves hard climate tasks to Durban summit in 2011” (*Guardian*, 14 December 2010), followed by “Durban Climate Deal Impossible Say US and EU Envoys” (*Guardian*, 18 April 2011).

they have exited the scene. Better yet, in doing so they might strive to seize the ethical high ground by declaring such a fix a “necessary” and “lesser” evil to prevent climate catastrophe. (Implausible? Welcome to the emerging debate about geoengineering.)

This is a grim state of affairs. However, recognizing the shape of the perfect moral storm can help us to make progress. We face a profound global and intergenerational challenge that current institutions and theories were not designed to meet. Given this, we need to move beyond the short-term economic and geopolitical framings that dominate current public discussion. We must acknowledge the global and intergenerational power that we yield, and take responsibility for it, rather than taking solace in comfortable distraction. No one will stop us from exploiting that power but us. This is why ethics is at the heart of the matter.

II

Key Points

As we have just seen, the central message of *A Perfect Moral Storm* is that humanity currently faces a distinctive kind of ethical challenge and climate change is a paradigm example. Let me offer a brief outline of the parts, and highlight some key points.

Part A offers an overview of the perfect moral storm analysis. Chapter 1 presents the basic metaphor, distinguishes its main elements, and explains why these are especially problematic in the case of climate change. Chapter 2 discusses the different motivational assumptions that might drive the storm, and explains my own institutional approach. According to this view, we currently lack effective institutions to translate genuine

intergenerational (as well as global and ecological) concern into effective policy. In this chapter, I also criticize some “green energy revolution” arguments and highlight a further morally salient alternative to the idea that the perfect moral storm involves the ruthless exploitation of self-interest, namely that to some extent it may rest on more superficial and in some ways incompetent behaviors that seem more morally pathetic than evil.

Part B discusses the global storm by considering two popular but competing diagnoses of the structure of the current international problem. According to the optimistic analysis (represented by its proponents through a simple ‘Battle of the Sexes’ model from game theory), addressing climate change does not really require truly global cooperation, but only that of a substantial, “critical mass” of countries. According to a more pessimistic analysis (represented through prisoner’s dilemma and tragedy of the commons models), truly global cooperation is necessary. I argue that the facts of climate change make the optimistic analysis largely untenable for the global storm considered as such, and in ways that support the more pessimistic case. However, I go on to claim that, though there are important differences between the prisoner’s dilemma and tragedy of the commons models, either way the more pessimistic analysis is itself not bleak enough, since it neglects the background presence of the intergenerational storm. As a result, we might expect nations to indulge in a modest “wait and see” policy that focuses on only short- to medium-term concerns. Unfortunately, we see evidence for such “shadow solutions” in the history of global climate policy, and especially in the Kyoto and Copenhagen frameworks. Interestingly, their existence may help to explain the initial appeal of the optimistic ‘battle of the sexes’ analysis.

Part C considers the intergenerational storm more directly, and constitutes the theoretical heart of the book. Chapter 5 sets out

the basic structure of the intergenerational problem, suggesting that it operates at various social levels. It also offers views about why generations as such are an important normative category, why we should not expect either an invisible hand or generational overlap to solve the problem, and why the philosophical nonidentity problem does not overwhelm either the climate case or the relevance of the tyranny of the contemporary more generally.³

Chapter 6 assesses whether the application of the tyranny of the contemporary analysis to climate change is undermined by the possibility that severe impacts may be imminent: if catastrophe is coming soon, the thought goes, doesn't the intergenerational problem disappear? I argue that it does not, and moreover that (counterintuitively) the temporal proximity of major negative impacts may make matters worse, even perhaps to the extent of setting off the equivalent of an intergenerational arms race.

Part D discusses the theoretical dimension of the perfect moral storm. Chapter 7 introduces a global test for political institutions and moral and political theories, and argues that we have strong grounds for thinking that current versions of both are failing this test. It also suggests that theories can be opaque, complacent, and evasive in the face of serious problems, and that this is a live worry in the case of climate change. Chapter 8 offers as an example of these problems attempts to apply economic cost-benefit analysis, the leading public policy tool of the day, to climate change. Such analysis is often criticized by philosophers and environmentalists; but in the present case, it also comes under pressure from many of its usual supporters.

Part E discusses the problem of moral corruption. Chapter 9 explains the basic problem and then illustrates its relevance

³ The latter is taken up more fully elsewhere (see Gardiner 2009).

through a disturbing comparison of some of the public debate about climate change with a paradigm case discussed by Jane Austen in *Sense and Sensibility*. The idea is that there are strong parallels between Austen's arguments and ours, and both are wrong for similar reasons. This should trouble us. No morally serious agent would want to be portrayed as the Austen parallel suggests.

Chapter 10 considers how the problem of moral corruption may evolve over time, as climate change progresses. It does so by exploring how the perfect storm analysis might illuminate some recent arguments for the pursuit of geoengineering. In addition, it assesses what might be at stake in the debate about whether geoengineering should be pursued as a "lesser evil", including different meanings of 'evil'. In particular, it highlights a concern for *tarnishing and marring evils* that casts further light on the ethical challenge of the perfect storm.

Part F brings the book to a close. Chapter 11 introduces the important idea of an ethics of the transition, and takes some steps towards one through commenting on some basic concerns about scientific uncertainty, precautionary action, responsibility for past emissions, the allocation of future emissions, and the shape of individual responsibility. Chapter 12 summarizes the main claims of the book, and says something about the prospects for the immediate future. Appendix 1 considers and rejects Garrett Hardin's identification of the global environmental tragedy with world population growth. Appendix 2 illustrates how we may be vulnerable to epistemic as well as moral corruption through a discussion of three of Michael Crichton's claims in the author's message accompanying his novel *State of Fear*.

In my view, *A Perfect Moral Storm* introduces a number of distinctive ideas which, though they remain (deliberately) underdeveloped, are worth highlighting and pursuing further.

These include the notions of: the ethics of the transition (chapter 11), an intergenerational arms race (chapter 6), marring and tarnishing evils (chapter 10), moral corruption (chapter 9), shadow solutions (chapter 4, 10), theoretical complacency and other vices (chapter 7). Specific discussions which also seem distinctive and to have gathered some attention include those of: the Austen analogy (chapter 9), economic discounting (chapter 8), epistemic corruption (appendix 2), and Hardin's view of population ethics (appendix 1). Some of these ideas are developed more fully in the many other papers on climate ethics I have written that are not represented in *A Perfect Moral Storm*. Some of these other pieces develop some of my specific views on topics such as the role of virtue, responsibility, precaution, and human rights.

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SYMPOSIUM
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GAME THEORY AND THE ETHICS OF
GLOBAL CLIMATE CHANGE

BY RONY SMEAD AND RONALD SANDLER

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Game Theory and The Ethics of Global Climate Change

Rory Smead

&

Ronald Sandler

Stephen Gardiner begins *A Perfect Moral Storm* with the claim that “Sometimes the best way to make progress in solving a problem is to clarify what the problem is” (3).¹ One of his goals in the book is to do just this for global climate change—or, more precisely, for the problem of why it has been so difficult to generate national policies and international agreements to address it. He believes that global climate change is the “perfect moral storm” in that it has several features that make generating action to address it extremely difficult—for example, it is intergenerational, global in scale, involves difficult to quantify values, and is multi-level (e.g. international and national). His purpose is “to get clearer about” these features of the problem “as a preliminary to generating and assessing potential solutions” (4). Central to this project is game theory. Gardiner employs several different game theoretic approaches—e.g. Prisoner’s

¹ Stephen Gardiner, *A Perfect Moral Storm. The Ethical Tragedy of Climate Change* (Oxford: Oxford University Press 2012). Unless otherwise specified, parenthetical references refer to this text.

Dilemma and Battle of the Sexes—to try to shed light on the problem and to explain why it is so difficult to address.

In this commentary, we focus on Gardiner’s use of game theory to illuminate the problem of generating responsiveness to global climate change. Gardiner is quite up front that he does not provide a “full account of the role of game theory in ethical analysis” (50). So this commentary addresses a part of his project that is not fully articulated within *A Perfect Moral Storm*, but that is crucial to it. We agree with Gardiner that clarifying a social problem is often a crucial prelude to effectively addressing it. We also agree with him that game theory can play a valuable role in ethical analysis, and that one of its functions is helping to characterize problems. We further agree with him that the issue of why there has been so little responsiveness to global climate change is one that game theory can help to illuminate. However, we think that game theory can play other, more robust roles as well. We also have some concerns about Gardiner’s general approach to using game theory to illuminate the problem of global climate change, as well as some concerns about his uses of particular games. In Section 2, we focus on the relationship between game theory and ethics, as well as on Gardiner’s general approach to applying game theoretic analyses to climate change. In Section 3, we discuss some particular games that Gardiner uses and how he uses them, as well as some games that he might have employed but did not. Overall, we find that much of Gardiner’s use of game theory is both appropriate and helpful. However, in some other respects Gardiner is under-utilizing game theoretical analysis or not using the relevant games in the most effective ways.

II

Ethics and Game Theory

In *A Perfect Moral Storm*, Gardiner’s approach to using game theory to characterize the problem of climate change is to try to find the game that is descriptively accurate. By that we mean he compares the structure of various games—particularly with respect to player positions and payoff possibilities—to the situation of climate change “players” (e.g. nations, businesses, and individuals) to see if the game accurately represent the player’s positions relative to each other and the problem. He does this, at some length, with the Prisoner’s Dilemma (55ff; 104ff), Battle of the Sexes (87ff), and tragedy of the commons (108ff), for example. The idea is that if we can match the right game theoretic structure to the problem of climate change, then we can apply what we know of that game to better understand why it is that so little progress has been made in addressing climate change. Moreover, we can begin to explore methods for finding positive solutions or outcomes within those games to see if they might apply to the problem of climate change. This is a fruitful approach to using game theory in ethics. It allows us to: 1. Identify key features of the problem; 2. Characterize possible solutions spaces; 3. Explore possible strategies for getting us to desired solutions.

In these respects, game theory is not prescriptive. It does not provide a method of determining what solutions are desirable (or ethically preferable) or what means are acceptable for accomplishing them. Nor does it tell us which features of the problem are ethically salient; or whether (or how urgently) we ought to work to solve the problem in the first place. What it can do is describe which features of the problem make it difficult to solve; help to determine whether solutions are possible; and help to identify methods or mechanisms (e.g. incentive changes) that

can facilitate movement toward certain solutions. In *A Perfect Moral Storm*, Gardiner is focused on the first of these: the features of the problem that make it difficult to solve. The question, after all, is why, if global warming is such a large problem and we have been working on it for two decades, so little has been accomplished (116). So while Gardiner's use of game theory to characterize the problem is appropriate, it is not all that game theory can contribute to descriptive ethics. Moreover, it might not even be the most valuable role it can play. After all, in this role it is not so much that the games illuminate the problems, but rather the problems are matched to the appropriate games, which if done well, requires prior knowledge of both the problems and the games. The value, or how the games bring in new information on the problem, arises when we look at how the games that are operative can help illuminate possible solutions and pathways to them. Gardiner appears sympathetic with this—after all, he says that characterizing the problem is prelude to exploring solutions.

However, it is important in evaluating which games are descriptively accurate for climate change that we be clear what game theory does and does not (and can and cannot) characterize. First, no game is going to be a comprehensive characterization of the problem, since the games are at best idealizations for only particular features of an actual problem. This is particularly so for a problem like climate change, where there are multiple levels (e.g. international, national, and personal) and multiple types of “players” or agents (e.g. governments, corporations, and individuals). Moreover, even if we could represent the problem in one big game, this misses part of the point of game theory—its ability to simplify strategic interactions so that their underlying principles can be understood. We don't want a fully realistic game because that would be just as hard as the real climate situation to analyze. Given this, it should not be taken as problematic if a game “fails as a *general* account of the problem posed by global

climate change” (124). The descriptive use of climate change should not involve asking ‘Which game theoretic is the right one for climate change?’ as Gardiner often seems to (e.g. 106), but rather ‘Which games can usefully characterize which aspects of the climate problem?’

Furthermore, it should not be taken as problematic if there are aspects of the climate problem that particular games fail to characterize. For example, Gardiner is critical of the tragedy of the commons analysis of climate change because it does not adequately capture certain moral dimensions of the problem. As he puts it, “I conclude that the basic tragedy of the commons model is, at best, seriously incomplete. The model’s neglect of differences in vulnerability, and especially the plight of the global poor, means that it obscures vital features of the problem at hand” (122). But game theoretic analysis (including tragedy of the commons) is not meant to capture those features of the problem—it is a decision theoretic model—and it would only obscure other aspects of the problem, including moral ones, if it were supposed that it did constitute a full characterization of the problem. Moreover, to restate a point made above, game theoretic analyses do not provide assessments of which problems are ethically important, which solutions are ethically preferable, or which approaches to generating solutions are ethically acceptable. Therefore, it should be no surprise that game theory, let alone a particular game, often fails to capture all morally salient features of the climate problem.

That said, there are games that have been used to study fairness, such as the Nash bargaining game or the Ultimatum game.² These games deal with distribution of goods rather than

² K. Binmore, *Natural Justice* (Oxford: Oxford University Press 2005); B. Skyrms, *The Evolution of the Social Contract* (Cambridge: Cambridge University Press, 1996)

achieving some cooperative goal. For reasons already discussed, they do not capture the full complex nature of the climate crisis, or all the morally salient features of it. However, they represent one important aspect of solving the problem—any agreement on mitigation is going to involve questions of distribution. Games of cooperation and social dilemmas have received the majority of attention in game theoretic approaches to climate change, but other types of games should also be considered (we discuss this point again below). Some games might be useful for characterizing certain aspects of international climate negotiations (e.g. bargaining games), while others are useful for characterizing competition over natural resources (e.g. Chicken) or simply coordination to achieve a common good (e.g. the Stag Hunt). Again, rather than attempt to identify the game that is descriptively adequate for representing the climate problem, a more effective approach would seem to be a pluralistic one that uses multiple games to illuminate different aspects and dynamics of a complicated social situation.³

III

Game Theory and Climate Change

Much of the game theoretic analysis in *A Perfect Moral Storm* involves the well-known Prisoner's Dilemma and various extensions of it—e.g. public goods games and asymmetric versions. There is good reason for this. The Prisoner's Dilemma and similar games represent cases of deep and serious conflict between individual self-interest and the collective good. Everyone

³ See S.J. DeCanio and A. Fremstad, "Game theory and climate diplomacy," *Ecological Economics* 85 (2013), 177-187, for an overview the ways in which all two-player, two-strategy games may be relevant to climate change.

would be better off if everyone cooperated, but it is in no one's self-interest to do so, even if everyone else is going to cooperate. Because cooperation is irrational from the perspective of individual self-interest, it does not form an equilibrium of the game and cooperative states are unstable. Thus, the Prisoner's Dilemma represents the "hard case" for solving a cooperation problem: if you can solve the problem of cooperation in the Prisoner's Dilemma, you can solve it in a number of other games as well. Furthermore, there are several important aspects of climate change, such as mitigating carbon emissions, which seem to mirror a Prisoner's Dilemma.

However, the important decision-theoretic features of the climate problem are not exhausted by the Prisoner's Dilemma. Indeed, Gardiner acknowledges the limitations and incompleteness of this model in many places. Gardiner also employs other games, such as the Battle of the Sexes, which is a game of coordination where each player has a different preference over where to coordinate. The Battle of the Sexes represents a more promising situation than the Prisoner's Dilemma: cooperation is stable and rationally justifiable. But, Gardiner argues that "none of the main claims of the broader Battle of the Sexes model...seems likely to be true of climate change," and consequently that "we should look elsewhere for a compelling account of the shape of the global storm" (102). We agree that Battle of the Sexes does not adequately represent the climate problem (i.e. it is not descriptively accurate), but do not think it should be entirely dismissed because of this. Games such as the Battle of the Sexes should not be viewed as an alternative to the Prisoner's Dilemma (and related games), but rather as a way of representing different aspects of the problem. In this case, this game can illuminate an important obstacle for cooperative endeavors that is missed in the Prisoner's Dilemma: the Battle of the Sexes illustrates what is known as the "equilibrium selection

problem” in game theory.⁴ Most games are not like the Prisoner’s Dilemma, which has a unique (and bad) equilibrium or “solution.” Most games have multiple equilibria and the question becomes, which one should we expect to see? And how do we facilitate convergence to some preferred equilibria over the other possibilities? Consequently, even if we somehow solve the Prisoner’s Dilemma (by changing the game in some way) and make cooperation a possible stable solution, there is still the problem of *reaching* that positive solution.

These points are perhaps best illustrated by another game, the Stag Hunt. In this game two players in a joint stag hunt are simultaneously faced with a decision to stick to their posts (cooperate) or to abandon their post and hunt hare (defect). Hunting hare provides a moderate but certain payoff independent of the actions of others. Hunting stag provides a high payoff if the other player cooperates and nothing if the other player defects. In this game, cooperation is one equilibrium and non-cooperation is another: cooperation is a possible solution to this game (unlike the standard Prisoner’s Dilemma), as is non-cooperation. The cooperative equilibrium is optimal but risky because everyone loses the gains if one player fails to cooperate. The non-cooperative equilibrium is suboptimal but risk free. Gardiner only briefly considers the Stag Hunt (114, footnote 14) and dismisses it for not capturing the climate problem as well as, say, the Prisoner’s Dilemma.

However, if we abandon the idea of trying to find the game that best represents the climate problem, and instead focus on what each game might illuminate about the problem, the Stag Hunt should not be so quickly dismissed. It represents a different,

⁴ C. Harsanyi and R. Selton, *A General Theory of Equilibrium Selection in Games* (Cambridge, MA: MIT Press, 1988); L. Samuelson, *Evolutionary Games and Equilibrium Selection* (Cambridge, MA: The MIT Press 1998).

but also crucial, obstacle to social cooperation. The Prisoner's Dilemma represents the problem of stability, whereas the Stag Hunt represents a case where there are stable preferable states, but they are hard to reach, since we are "stuck" in a suboptimal but equally rational solution (from the view of individual self-interest). Furthermore, many of the potential "solutions" to the Prisoner's Dilemma essentially involve changing the incentives and payoff structure of the game, thereby transforming it into a Stag Hunt.⁵ That is, standard "solutions" to the Prisoner's Dilemma solve the problem of stability of cooperation, but do not solve the equilibrium selection problem; they do not tell us how to get from non-cooperation to cooperation, only that once we achieve cooperation it will persist. The Stag Hunt represents this particular problem in a simple and precise way. Therefore, both the game and the problem it illustrates are valuable to characterizing the problem of generating responsiveness to global climate change. That the game is dismissed and the problem of multiple stable states is not highlighted in *A Perfect Moral Storm*, where the core project is to characterize the problem of climate change using game theoretics, seems to us to be an important oversight.

There is another aspect of game theory that we believe is importantly relevant to the climate issue, but is not discussed in *A Perfect Moral Storm*. Evolutionary game theory is used to represent dynamic settings where (boundedly rational or non-rational) individuals learn and adapt over time.⁶ The motivation for this approach includes the equilibrium selection problem, along with the observation that real agents are less than fully rational. These

⁵ B. Skyrms, *The Stag Hunt and the Evolution of Social Structure* (Cambridge: Cambridge University Press, 2004).

⁶ See B. Skyrms, *The Evolution of the Social Contract* (Cambridge: Cambridge University Press, 1996), for an overview on applications of evolutionary game theory to topics in descriptive ethics.

considerations have led game theorists to be concerned not just with what solutions a game has, but whether and under what conditions the solutions can be reached.⁷ Considering the way in which boundedly rational individuals may adapt or change over time is important if we would like to understand when such agents might be able to reach certain solutions and when they might not. Gardiner's game theoretic analysis is largely focused on the equilibria or "solutions" to the games and not on the way in which behavior within games may change over time. As we discussed earlier, if we are too focused on the stability of cooperation in solving the climate problem, we may miss the other barriers to achieving cooperation and other ways in which we might be able to facilitate reaching positive solutions.

IV

Conclusion

This commentary has focused primarily on the ways in which Gardiner's use of game theory to help to understand and develop responsiveness to global climate change could have been expanded or improved. So we should like to conclude by emphasizing again that we believe that Gardiner has the big methodological picture right—it is crucial to solving this problem that we understand it better and game theoretic analysis is a valuable tool in doing so. We also believe that his discussion of the problem in light of the Prisoner's Dilemma and tragedy of the commons, in particular, makes a very large contribution in this regard. *A Perfect Moral Storm* should help readers to appreciate the

⁷ L. Samuelson, *Evolutionary games and equilibrium selection* (Cambridge (MA): MIT Press, 1998).

importance of game theoretical analysis to climate change as well as to other social problems.

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SYMPOSIUM
A CHANGING MORAL CLIMATE



JACK, JILL, AND JANE
IN A PERFECT MORAL STORM

BY DALE JAMIESON

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Jack, Jill, and Jane in a Perfect Moral Storm

Dale Jamieson

Stephen Gardiner's *A Perfect Moral Storm* is a wonderful book. It goes a long way towards explaining why we have failed to act on climate change. I agree almost entirely with its broad conclusions and with most of its specific claims. The author and I are comrades in the struggle, and like-minded in the ways that matter most. Still, there is an important difference between us. I do not want to overstate this difference nor exaggerate its significance. However, I believe that articulating this difference can help clarify why moral arguments have largely failed to move us to respond to climate change.

Gardiner and I agree that our response to climate change constitutes a “profound ethical failure” but we disagree about the nature of this failure.¹ Gardiner thinks that we have moral norms and concepts that apply that we are not living up to. Thus we are the proper subjects of moral condemnation. He charges us with “willful self-deception and moral corruption”(11). I do not deny that with respect to some of our climate change contributing behavior there are applicable moral norms which we fail to live

¹ The quoted words are from the flyleaf of Stephen M. Gardiner, *A Perfect Moral Storm: The Ethical Tragedy of Climate Change* (New York: Oxford University Press, 2011). Parenthetical page references are to this book.

up to, and that willful self-deception and moral corruption are to some extent involved in our contributions to climate change as they are in many other areas of life. My claim is that with much of our practical reason, both moral and prudential, we do not have adequate norms and values that motivate us to address climate change. This is a “profound ethical failure”—or to use another of Gardiner’s descriptions, a “tragedy”—but it is not the same kind of failure or tragedy as failing to live up to one’s principles. In my opinion, the really profound moral challenge of climate change consists in formulating and implementing new moral norms and concepts that are adequate to the problems we face in this unprecedented period in human history.

In the next section I present an analogy that is intended to help explain why we do not see many acts that contribute to climate change as presenting serious moral challenges. I then respond to Gardiner’s criticisms of my use of this analogy. In the following section I discuss an analogy that Gardiner has offered between a case drawn from Jane Austin’s novel, *Sense and Sensibility*, and some challenges that we face with respect to climate change. Finally, I draw some conclusions.

I

Jack and Jill

Most of the time we do not subject people’s actions to moral evaluation. This may be because we consider most of what people do to be ‘their business,’ belonging to a private sphere that is beyond the reach of morality. Or it may be because we regard most of what people do to be morally permissible. Generally our moral thinking only consciously engages when something strikes

us as not quite right. There are also acts that come to our attention because they are morally exemplary or ‘beyond the call of duty,’ but these occur less frequently than the feeling that something has gone wrong. Various moral theorists would like to dislodge this way of seeing things, but nevertheless this is more or less the view that is embedded in common sense morality. When it comes to acts, the most fundamental distinction in our prevailing moral consciousness is between those that are morally suspect and those that are not, and we see most of what people do as in some way for some reason outside the domain of moral evaluation.

A paradigm of an act that is morally suspect is one that has the following characteristics. An individual acting intentionally harms another individual; both the individuals and the harm are identifiable; and the individuals and the harm are closely related in time and space.

Consider an example.² Suppose that Jill has parked her bicycle on the porch of her house and then gone inside to make dinner. Jack, who has been looking for a bicycle to steal, sees Jill’s bicycle on the porch, cuts the lock, and rides off. The following is an apt characterization of this case:

1. Jack intentionally steals Jill’s bicycle.

² I introduced these cases in “The Moral and Political Challenges of Climate Change,” in *Creating a Climate for Change: Communicating Climate Change and Facilitating Social Change*, edited by S. Moser and L. Dilling (New York: Cambridge University Press, 2007), 475-482, and discussed them further in *Reason in a Dark Time: Why the Struggle Against Climate Change Failed—And What It Means for Our Future* (New York: Oxford University Press, 2014). These examples were inspired by J. Glover, “‘It Makes No Difference Whether or Not I Do It,’” *Proceedings of the Aristotelian Society*, Supplementary Volumes 49 (1975), 171-209.

In this case Jack intentionally acts in such a way as to knowingly harm another individual.³ Both the perpetrator and victim (Jack and Jill) are clearly identifiable, and they are closely related in time and space. This case is a clear candidate for moral evaluation, and most of us would resoundingly say that what Jack did was wrong.

Consider, however, what happens when we alter the case along various dimensions. We may still see the case as a candidate for moral evaluation but its claim to be a paradigm weakens. Consider the following examples:

2. Jack is part of an unacquainted group of strangers, each of which, acting independently, takes one part of Jill's bicycle, resulting in the bicycle's disappearance.
3. Jack takes one part from each of a large number of bicycles, one of which belongs to Jill.
4. Jack and Jill live on different continents, and the loss of Jill's bicycle is the consequence of a causal chain that begins with Jack ordering a used bicycle at a shop.
5. Jack lives many centuries before Jill, and consumes materials that are essential to bicycle manufacturing; as a result, it will not be possible for Jill to have a bicycle.

In 2 we transform the agent who harms Jill into an unstructured collective. In 3 we reduce the amount of harm that

³ There are some ambiguities about intentional action so let me stipulate the following. When I say that an agent intentionally *phi*s, I will mean that the agent acted intentionally and that *phi*-ing would be a reasonable description of the act from the agent's point of view whether or not the agent acted under that description.

Jack causes Jill to a minimum. In 4 we disrupt the spatial contiguity between Jack and Jill and cancel Jack's *mens rea*.⁴ In 5 we cancel Jack's *mens rea* and also disrupt the temporal contiguity between Jack and Jill. Each case, I claim, is less of a paradigm for moral evaluation than Case 1. Indeed, some would not see anything morally questionable about Jack's actions in 4 and 5. 2 and 3 may still be seen as candidates for moral evaluation, but less obviously so than 1. People who see Jack's action as wrong in 2 and 3 are likely to see it as less wrong than in 1.

Now consider Example 6 which incorporates all of the changes serially considered in examples 2-5.

6. Acting independently, Jack and a large number of unacquainted people set in motion a chain of events that causes a large number of future people who will live in another part of the world from ever having bicycles.

For many people this is just an abstract description of normal, everyday behavior. There is nothing suspect about it at all. For other people the perception persists that there is something morally questionable about this case. This is because what some people take to be at the center of a moral problem persists: some people have acted in a way that harms other people. However, most of what typically accompanies this core has disappeared, and this is why some people do not see this case as presenting a moral problem. Even for those who do see this case as presenting a moral problem, the wrongness of the acts and the culpability of the agents are greatly diminished in comparison to Example 1. In Example 6 it is difficult to identify the agents, the victims, and the causal nexus. Nor does it appear that anyone has intentionally

⁴ *Mens rea* is Latin for "guilty mind." In many cases it is regarded in the law as a necessary condition for criminal liability.

deprived future people who will live in another part of the world from ever having bicycles. The fact that they will not have bicycles is just a consequence of Jack and others getting on with their lives. In these circumstances it is difficult for the network of moral concepts that involve responsibility and harm to gain traction. In my opinion it is Example 6 that bears the greatest resemblance to the climate change case. If I am right about this then it is not surprising that many people do not see climate change, at least with respect to individual responsibility, as presenting a moral problem.

Stephen Gardiner and others have challenged this analogy.⁵ Some of the charges involve claims to the effect that the stakes are much lower in the Jack and Jill case than in the climate change case; that our contributions to climate change involve collective endeavors and not only individual actions; that our reasons for performing acts that contribute to climate change are often much more trivial than Jack's reasons for acting in ways that contribute to future people not having bicycles; that climate change affects present people who are citizens of our own countries and people who are not poor, as well as future people who are citizens of other countries and are poor. Collecting these thoughts Gardiner offers the following analogy which he thinks is closer to the case of individuals acting in a way that contributes to climate change case than my Case 6:

7. George and his buddies like to have big firework displays over the river. These shoot burning debris into the air, predominantly over the poorer neighborhoods on the other side. This has already imposed and continues

⁵ Stephen Gardiner, "Is No One Responsible for the Climate Change Tragedy: Climate Change as a Challenge to Our Ethical Concepts," in *The Ethics of Global Climate Change*, edited by D. Arnold (Cambridge: Cambridge University Press), 38-59. Peter Singer and Rebecca Tuvel have also challenged this analogy in talks and unpublished comments.

increasingly to impose, a serious risk on many people in the area that their houses will catch on fire. George and his buddies are aware of this risk, keep saying that they will cut back, buy safer fireworks, contribute funds to the fire department in the poorer neighborhoods, and so on. But they don't. Instead they keep making the displays bigger. They like fireworks. (They could like other things too. But they are used to fireworks.)⁶

Gardiner thinks that “this example conveys a sense of moral severity substantially beyond Jack 6” and that this shows that my claim that “our concepts of individual moral responsibility must be extended or revised requires further defense.”⁷

Gardiner and I agree that the cases that are most analogous to many actions that contribute to climate change (my Case 6, his George 7) are less morally valenced than a paradigm case of moral responsibility (my Case 1, his George 1).⁸ What we disagree about is the distance between Case 6 and George 7, and the paradigms of morally valenced acts. I claim that the distance is so great that we tend to see the acts that are most analogous to some of those that contribute to climate change as not morally urgent or perhaps not morally valenced at all. Gardiner, on the other hand, sees these acts as conveying a sense of moral severity, even if not to the same degree as the paradigms.

It is helpful to clarify the disagreements. My claim is not that many of the acts that contribute to climate change are best seen as like Case 6, but rather that through the lens of common sense morality we in fact tend to see these acts as analogous to Case 6. What Gardiner seems most clearly committed to is that we ought

⁶ *Ibid.*, 47.

⁷ *Ibid.*, 47.

⁸ In George 1, George steals Sanjay's smoke alarm and then sets fire to Sanjay's house while Sanjay is asleep inside. He does this because he is bored and would like a little excitement.

to see many acts that contribute to climate change as more like his George 7 than my Case 6. Since my claim is about how we tend to see such acts and Gardiner's claim is about how we ought to see them, we do not yet have a disagreement. However, since Gardiner thinks that his George cases undermine my argument he is committed to the claim that we do tend to see some central acts that contribute to climate change as more analogous to George 7 than to my Case 6. This, I think, is incorrect. Although empirical research would be required to show this conclusively, it seems obvious to me that people do not see driving an SUV, overheating a house, or flying in an airplane as like throwing fireworks over poor parts of town. Whatever the weaknesses of my Case 6, it is closer to how most people see some actions that contribute to climate change than George 7.

I am also skeptical about Gardiner's claim that we ought to see such actions as analogous to George 7. George 7 fails to capture the temporal and spatial dislocations, and indirect relations between individual acts that contribute to climate change and climate change damages. Nor are most such acts as gratuitous, well-understood, or inherently risky as shooting burning debris into the air for purposes of entertainment. Still, analogies are not identities and argument can go on indefinitely about which hypothetical cases are the best analogies to various actions.

What is most important is to see that I use the Jack and Jill cases in what is largely an explanatory project. I want to understand why we generally do not see our individual actions that contribute to climate change as morally valenced. It can be asked why we should be interested in this explanatory project. One answer is that insofar as we are interested in understanding and managing the real problem of climate change then appreciating people's actual motivational patterns matters. However, as Gardiner astutely notices, there is another more

fundamental reason why I think this project is important. For me and much of the philosophical tradition, there is a conceptual connection between morality and motivation; the study of one necessarily implicates the other. Defending this claim and spelling out the exact nature of the relations involved are obviously beyond the purview of this paper. Gardiner is right to point out, however, that this commitment is part of what informs my project, and different theoretical starting points might lead one to focus on different questions and assess their significance differently.

II

Steve and Jane

In one of the most interesting parts of *A Perfect Moral Storm* Gardiner discusses corruption, a failing that he thinks helps to explain why we pass the costs of our climate changing behavior on to the future, the poor, and nature. He illustrates this failure with an example from Jane Austen's *Sense and Sensibility*. Gardiner's discussion is brilliant, but I am skeptical about the extent to which corruption is central and specific to our failures regarding climate change (indeed, it is not entirely clear how central and specific Gardiner thinks corruption is either) and I also wonder about the aptness of the analogy.

Gardiner's concern with corruption stems from his view that the costs of climate change can be passed to the poor, the future and nature (what he calls "buck-passing"), and that we face strong temptations to do so. He writes that

If we are tempted by buck-passing, but reluctant to face up to moral criticism for succumbing to it [...] we are likely to be attracted to weak or

deceptive arguments that appear on the surface to license such behavior [...] (302).

Gardiner distinguishes “moral corruption” and “corruption of the understanding,” and discusses both “corruption in general” and “moral corruption.” As far as I can see, he doesn’t really provide an explicit account of the distinction between moral corruption and corruption of the understanding, though it is possible to infer one from what he says (I think corruption of the understanding is the susceptibility to bad arguments that he mentions). Gardiner seems skeptical that a “strong philosophical account of corruption” (303) can be given, but nevertheless characterizes what he calls “a core case of corruption”:

the illegitimate taking advantage of a position of superior power for the sake of personal gain (304).

The problem with this characterization is that it is not normally wrong to take “advantage of a position of superior power for the sake of personal gain.” When individuals do this, it is usually regarded as just getting ahead in life. For example, Jack has superior physical power so he becomes a fitness instructor; Jill has superior mathematical power so she becomes a computer scientist. When groups and collectives do this in the political domain, it is simply interest group politics. What distinguishes these from cases of corruption is that they are “legitimate taking(s) of advantage while cases of corruption are illegitimate. Since ‘illegitimate’ is such a general, theory-relative term, this characterization of the core case of corruption seem unilluminating.

When it comes to understanding moral corruption Gardiner turns to Kant:

The thoughts that I take from Kant are [...] that moral corruption is: (a) a tendency to rationalize, which (b) casts doubt on the validity and/or strictness of moral claims, by (c) seeking to pervert their status and substance, and in doing so (d) aims to make those claims better suited to our wishes and inclinations, and (e) destroys the characteristics in virtue of which we respect them (307).

The problem is that Kant (as opposed to some Kantians) actually had very little to say about moral corruption (it comes up mostly in relation to his discussion of “radical evil”). Insofar as Kant has such a notion it seems quite general, most closely connected to the third meaning of ‘corruption’ given in the OED: “moral deterioration or decay; [...] the perversion of anything from an original state of purity [...]. Despoiling of virginity, violation of chastity.”

What I take Kant’s view to be, for what it’s worth, is that the source of corruption is in the clash between inclination and reason, is expressed in overvaluing oneself, and made worse by social conditions, especially war. Gardiner thinks that in some cases of moral corruption “it can, from the external perspective, be difficult to find anyone to blame in the usual way” (307). For Kant it would appear that there would be no problem finding someone to blame in a case of moral corruption: it would be the agent who yields to inclination and overvalues himself. The deepest difference between Kant and Gardiner is that Gardiner is interested in corrupt acts while Kant is interested in corrupt agents.

Although Gardiner recognizes the difficulty and elusiveness of the concept, he wants moral corruption to be a specific enough notion to be explanatory in the climate change case. There is thus a lack of fit between Gardiner’s desire for a concept that is to some extent central and specific to our failures regarding climate change, and Kant’s rather watery notion.

Gardiner wishes to emphasize features of moral corruption that center on our “vulnerability,” susceptibility to “temptation,” and attraction to “weak or deceptive arguments” that serve our interests. These are features that are endemic to being human and it is difficult to see how they are especially explanatory in the climate change case. The antiquity and centrality of temptation in the Judeo-Christian tradition is evidenced by the story of Eve being tempted by the serpent. For that matter it is evidenced by a birthday card that I recently saw that read, “No need to lead me into temptation. I can find it all by myself.”

From my perspective the most important fact with respect to the ethics of climate change is that we do not morally valance many of the actions that contribute to the problem. However, it is true that some actions that contribute to climate change are morally valanced. Let us suppose for present purposes what I do not believe: that all of the following are examples of moral failure with respect to climate change.

A. I know that I ought to stay home and work on my climate change book but my desire to be with my lover wins (again), and instead I fly to Shanghai for the weekend.

B. I know that I ought to cut back on my carbon emissions but I’m not sure by how much and in what ways, so I continue to emit too much.

C. I believe that climate change will be devastating but I could be wrong (maybe the deniers are right, maybe we’ll be saved by some undiscovered feedback in the climate system, maybe adaptation or geoengineering will be successful), so I reduce my emissions a little and feel a little guilty about not reducing more.

D. I was going to ride my bike to school today but it was a little chilly out, so I decided to drive instead.

Notice how easy it is to think of analogues to these cases from other domains:

A') I know that I ought to visit my Aunt but my desire to go surfing wins (again).

B') I know that I ought to give more to charity but I'm not sure how much more or to which charities, so I continue to give what I know is too little.

C') I think that I ought to be vegan but I'm not sure that there isn't some argument that I haven't thought of that might relieve me of this obligation, so I'm a little more vegan than I would otherwise be and feel a little guilty when I go for the eggplant parmagian.

D') I set out to volunteer at the soup kitchen, but the bus was late, so I decided not to bother after all.

In some of these cases I know that what I am doing is wrong and I choose to live with the consequences (as some Hollywood vamp said to her weak willed partner, "Do you want to be a good person or do you want to be with me?"). In other cases I try to do what is right but am easily deterred. In still other cases I believe that some act is right but I don't believe it strongly enough to actually do it. We can taxonimize these failings in various ways (akrasia, hypocrisy, bad faith, corruption, and so on). These categorizations can be contested and others proposed, and these or other categorizations may or may not be illuminating

Now consider Gardiner's proposed analogy between our responses to climate change and the case from Jane Austen that he presents. In the Austen case, Henry Dashwood wishes to provide for his second wife and their children after his death, but the terms of his estate require that the estate passes to John, his son by his first wife. On his deathbed Henry extracts a promise from John that he will look after Henry's second wife and their daughters. John promises, apparently sincerely, but under the influence of his wife, Fanny, his resolve continuously weakens in an almost comical way. Ultimately, John does nothing at all to keep the promise.

Gardiner writes:

Our interest lies in Austen's vivid account of how easily John Dashwood moves from accepting a serious and apparently unassailable moral commitment to help his stepmother and half-sisters into dismissing that commitment almost entirely. Her tale illustrates just how seductive and familiar the devices of moral corruption are, and how vulnerable we are to them [...] (310).

The clarity of the Dashwood's [*sic*] folly helps us to see many of the corrupt arguments in the climate debate for the dangerous temptations they are (337).

Gardiner tries to show in detail that the considerations that Fanny adduces against the claim that John owes strong obligations to his stepmother and half-sisters have analogues in the case of climate change contributing behaviors. He characterizes some of Fanny's moves in the following way:

Some of the moves seek to dispute the application of the moral claim (e.g., *Excessive Burden; Prior Entitlement; Competing Special Relationships; Unreasonable Advocates*); others claim that compliance will have unintended bad consequences (e.g., *Opening the Floodgates; Undermining Autonomy*); a third group aims

to reduce the magnitude of the moral demand (e.g., *Budget Constraint; Demanding Mutual Benefit; Diminishing Victims' Needs; Shifting the Playing Field; Blessing in Disguise*); a fourth seeks to undermine the implementation of the duty (e.g., *Onerous Logistics; Discretionary Aid; Indirect Methods*); and a fifth group aims to breed resentment on the part of the duty-bearer (e.g., *Lack of Appreciation; Coveting the Victims' Goods; Recast the Victim*).

This is a terrific analysis of Fanny's rhetoric and arguments, and I agree that many of these arguments have analogues in varying degrees to patterns of thought and argument in the climate change debate. But this is hardly surprising. Fanny's moves are pretty generic and are available in almost any reasonably complex moral argument.

The most striking analogy between climate change and the Austen case is that they both involve intergenerational relationships. It is generally true that moral motivation flags when those to whom obligations are owed are not present, vivid, or causally efficacious. Because climate change is an intergenerational problem this applies dramatically, as Gardiner persuasively argues. However, even though both the Austen and climate change cases can be said to involve intergenerational relationships, this is misleading. In *Sense and Sensibility* the fundamental moral relationships are among Henry and the contemporaneous relatives who outlive him; in the climate change case the basic moral relationship is between us and non-contemporaneous, non-familialy related, future people. As a consequence, unlike future people in the climate change case, the stepmother and half-sisters could at least in principle call John and Fanny to account. This brings out some further differences between the two cases. Much of the argument in *Sense and Sensibility* is in the form of a dialogue while discussion of what we owe future generations in the climate change case is usually

conducted as the third-person. The husband/wife nature of Austen's dialogue contributes to the sense that John is not just trying to figure out the right thing to do, but he is also trying to please Fanny.

Another difference is that John's challenge is to keep a well-understood, widely accepted moral obligation to preserve his father's intentions with respect to the disposition of his property. We understand deathbed promises: that is why Fanny has to work so hard to overturn it, and why the slide into noncompliance is almost funny. In the climate change case it is not so clear what duties we have and to whom. Whatever is true, we have not assumed duties as clearly and explicitly as John has. Indeed, as I have argued, in order to reach the conclusion that we have such duties at least with respect to many actions, we must revise our moral concepts so that we see ourselves as acting wrongly when we engage in apparently innocent activities that make tiny contributions to harms that distant people will suffer centuries from now. This is quite unlike the obligation to keep a deathbed promise, thus fulfilling the intentions of one's father.

I am not convinced that Gardiner has identified a moral failing that is central and specific to our failure to address climate change that can illuminatingly be characterized as moral corruption, especially not one that can be associated with Kant. While an interesting proposal, I am not convinced by the aptness of the analogy between the Austen case and our failure to respond to climate change. Still, we can also learn from the disanalogies. What I take from the disanalogies that I have identified is that the climate change case is much more difficult than the one that Austen described; and since even a straightforward obligation like the one John is under can be rationalized away, we should be very pessimistic indeed that people will come to see themselves as

having duties not to contribute to climate change and then effectively act on them.

III

Conclusion: Steve and Dale

In this paper I have accentuated the differences between my views and Gardiner's. I have especially emphasized my view that we do not see many of the actions that contribute to climate change as morally valanced, in contrast with Gardiner's view that in many cases we fail to do what is right even by our own lights. Probably neither of us believes that the points that we have emphasized are the whole story. I want to close by bringing out a deep point of agreement. Our failure to act efficaciously in response to climate change indicates a crisis of agency, both in ourselves and in our institutions. Perhaps the greatest challenge of this century is to reconstruct and instantiate forms of individual and collective agency that will enable us to manage the problems that we face to live meaningful lives in a rapidly changing world.

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SYMPOSIUM
A CHANGING MORAL CLIMATE



MORAL TURBULENCE AND
GEOENGINEERING
A LINGERING HAZARD FROM THE
PERFECT MORAL STORM

BY CHRISTOPHER J. PRESTON

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Moral Turbulence and Geoengineering A Lingering Hazard from the Perfect Moral Storm

Christopher J. Preston

Stephen Gardiner's aptly titled *A Perfect Moral Storm* provides a deft philosophical analysis of why the challenges of climate change have proven so difficult to meet. Gardiner carefully lays out the mechanics and the psychology of the global community's response to climate change, a response that to date can only be judged as a staggering moral failure. His description of a "perfect moral storm" of factors shows how, even if the global community had not suffered from years of deliberate obfuscation on the part of those with vested interests in promoting fossil fuels and even if the public had not been side-tracked by a media determined to make a long-settled scientific question look like a highly uncertain partisan debate, climate change would have remained through it all a thoroughly difficult problem to solve.

Employing an insightful analytical eye, Gardiner teases apart how the global and intergenerational dispersion of climate change's causes and effects, the fragmentation of its actors, and both institutional and theoretical shortcomings have all combined to make it far too easy for the obfuscators, the drama-seekers,

and the just plain lazy to carry on kicking the climate can down the road. These factors together create a high potential for moral corruption, a failure of moral posture that becomes one of the key ideas developed throughout the book

Corruption most generally speaking is the “illegitimate taking advantage of a position of superior power for the sake of personal gain” (304).¹ With dramatically skewed vulnerabilities and heavily back-loaded impacts, corruption in the climate change arena results in a tendency to “distort our moral sensibilities in order to facilitate the exploitation of our global and intergenerational position” (8). Clearly the current generation in the wealthier nations has largely succumbed. People in these nations rarely blame each other for enjoying personal automobiles, non-essential air travel, and large, over-powered homes as long as they appear to be otherwise morally decent and remember, perhaps, to donate a bit of money towards developing world hunger around the holidays. To unseat us from this complacency, Gardiner performs the valuable service of warning about just how deep the perfect moral storm penetrates. The spatial and temporal features of climate change lead to bad actions in part because they target “our ways of *talking* and *thinking* about moral problems” (305, *emphasis in original*). After a while, the morally decent path is hidden beneath a conceptual fog. Illustrated by the evolving dynamic between John and Fanny, the “Dubious Dashwoods” of Jane Austen’s *Sense and Sensibility*, Gardiner shows how easy it is for otherwise decent persons to find themselves drawn into perverse and twisted ways of thinking. Even genuine attempts to solve the climate change problem can contain reasoning so distorted that the proposed

¹ Stephen Gardiner, *A Perfect Moral Storm. The Ethical Tragedy of Climate Change* (Oxford: Oxford University Press 2012). Unless otherwise specified, parenthetical references refer to this text.

“solution” ends up being self-justifying, self-serving, and manipulative.

If the problem of climate change stirs up a perfect moral storm, then the prospect of deliberately engineering the climate to push back against warming temperatures layers a vigorous moral turbulence squarely on top of the existing storm. In a chapter titled “Geoengineering in an Atmosphere of Evil,” Gardiner illustrates how the potential for moral corruption emerging from the perfect storm is realized in the “lesser of two evils” rationale for solar radiation management (SRM) research. Gardiner does not make any claims about the rightness or wrongness of actual deployment of SRM. Rather he scrutinizes the context in which discussions about SRM research are shaping up. It turns out to be a context rife with the potential for corruption. The rationale to “arm the future” by pursuing SRM research, ends up being self-justifying and self-serving in addition to making it far more likely that future people will find themselves in the tragic position of being forced to deploy. Geoengineering with SRM is a “convenient” (339, 396) option for a culture too distracted—and perhaps also too short-sighted and plain idle—to make the necessary changes to its practices.

It is beyond doubt that SRM has great appeal to those looking for an excuse to do little about current emissions levels. The fact that actors such as the American Enterprise Institute and Newt Gingrich, located on the extreme right of the American political system and typically hostile to the idea of emission reductions, have warmly embraced geoengineering only increases suspicions. SRM creates a “moral hazard” if placing hope in an engineering solution to warming temperatures draws attention away from emissions reductions. As Gardiner insightfully warns, in a context of gross political inertia we should be on high alert for deceptive and self-deceptive rhetoric. The corruption peaks, according to

Gardiner, when today's recommendation is for "modest geoengineering research only" (364-6, 368) to the neglect of efforts such as major emissions reductions, adaptation preparations, comprehensive climate compensation funds, a Manhattan project on renewables, and other serious measures.

With Gardiner's warning about potentially distorted reasoning heeded, it is interesting to step back from fears about how the discussion *could go* and consider how it is *in fact going*. It is notable, for example, that most of those advocating for more research on geoengineering also stress that research must be accompanied by serious emissions reductions. Paul Crutzen, in his landmark 2006 paper on stratospheric aerosols, pushed for a "combination of efforts" with reduction in greenhouse gas emissions "clearly the main priorit[y]."² The forward to the Royal Society's 2009 Report on geoengineering insisted "nothing should divert us from the main priority of reducing global greenhouse gas emissions."³ A US Bipartisan Policy Center review stated unequivocally that the panel "strongly believes that climate remediation technologies are no substitute for controlling risk through climate mitigation and climate adaptation."⁴ None of these important players think geoengineering research alone is enough. Holly Buck points out that atmospheric scientists "have worked hard to stress to policy makers that geoengineering is flawed—by no means a 'silver

² Paul Crutzen, "Albedo Enhancement by Stratospheric Sulfur Injections: A Contribution to Resolve a Policy Dilemma?" *Climatic Change* 77 (2006), 211-220, at 217.

³ Royal Society 2009, *Geoengineering the Climate: Science, Governance, and Uncertainty*, v.

<http://royalsociety.org/policy/publications/2009/geoengineering-climate>

⁴ Bipartisan Policy Center 2011, *Geoengineering: A National Strategic Plan for Research on the Potential Effectiveness, Feasibility, and Consequences of Climate Remediation Technologies*, 3.

<http://bipartisanpolicy.org/library/report/task-force-climate-remediation-research>

bullet’— and that geoengineering research must take place in a context of climate change management that includes mitigation and adaptation measures.”⁵

The sentiments expressed could, of course, be subterfuge. One could talk a serious-sounding talk about emissions reduction, all the while hoping that geoengineering would provide a way to allow continued inaction. In such a scenario the potential for moral corruption lurking in the background has surfaced as willful deception. Alternatively, advocates’ thinking about the problem may be so corrupted that they are unable to identify their position as self-serving. But is this likely?

Two common observations about SRM deployment suggest not. It is well known that SRM is haunted by a “termination problem.” If warming is forestalled by SRM while emissions continue to rise, then any event demanding a sudden termination of the deployment—such as a political or military crisis or an unforeseen ecological effect—would lead to very abrupt warming indeed, warming far more dangerous than any in store from unmitigated emissions alone.⁶ SRM is also haunted by the ocean acidification problem. Reducing solar insolation through stratospheric aerosols or cloud brightening leaves atmospheric carbon in the atmosphere, ensuring the continuation of ocean acidification and all the challenges associated with it.⁷ Since both of these problems are broadly appreciated it seems likely we

⁵ Holly Jean Buck, “Geoengineering: Re-making Climate for Profit or Humanitarian Intervention?” *Development and Change* 43 (2012), 253–270, at 258.

⁶ Granger Morgan and Katherine Ricke, “Cooling the Earth Through Solar Radiation Management: The Need for Research and an Approach to its Governance.” *The International Risk Governance Council* (2010), 13.
http://www.irgc.org/IMG/pdf/SRM_Opinion_Piece_web.pdf

⁷ Royal Society 2009.

should take the research scientists at their word and trust them that SRM alone is not their goal.

The policy arena is also revealing. International negotiators and governments have demonstrated a consistent reluctance to embrace geoengineering without first pursuing other steps to address climate change. At the 18th UNFCCC conference of the parties meeting in Doha in late 2012, the Chicago Tribune observed that geoengineering was garnering “scant enthusiasm.” Christiana Figueres, head of the U.N. Climate Change Secretariat, emphasized mitigation over geoengineering, suggesting “Let’s first use what we know ... There are so many proven technologies we know exist that are tried and true that have not been used to their maximum potential.”⁸ Rajendra Pachauri, chairman of the U.N.’s panel of climate scientists, expressed his own lack of enthusiasm by asking Reuters rhetorically “How can you go into an area where you don’t know anything?”⁹ At the same time as presenting a tepid front towards geoengineering, negotiators at Doha for the first time introduced the principle of “Loss and Damage” into the negotiations demonstrating at least in-principle a commitment to funds for adaptation and even compensation for the most harmed countries. A UK government position paper on geoengineering research states “it is premature to consider geo-engineering as a viable option for addressing climate change. The priority is, and must be, to tackle the root cause by reducing emissions of greenhouse gases from human activities and adapting to those impacts that are unavoidable” (DECC 2013).¹⁰

⁸ Josh Horton, “Views on Geoengineering from UNFCCC COP 18 in Doha,” December 3, 2012. *Geoengineering Politics Blogspot*.
<http://geoengineeringpolitics.blogspot.com/2012/12/views-on-geoengineering-from-unfccc.html>

⁹ Ibid.

¹⁰ Department of Energy and Climate Change (DECC), 2013. “Government View on Geoengineering Research.”

All of this suggests that, at least for the present, the international community is not approaching climate change simply by redirecting attention towards geoengineering. In the seven years since the taboo on discussion of SRM was broken by Crutzen, despite lots of hype, nobody yet seems to be embracing geoengineering at the expense of more traditional mitigative, adaptive, and compensatory strategies.

Again, this could all be subterfuge. The expressed reluctance of governments and the UN to publicly embrace geoengineering may be pure politics. Governments in the developed world could be publicly shunning geoengineering, all the while hoping that someone—perhaps a vulnerable nation—will end up doing it unilaterally to get the global community off the climate hook. Bad faith and moral corruption may be at the core of inter-governmental climate negotiations. But there is at least one more rationale worth considering for why serious emissions reductions, adaptation measures, and a pursuit of non-carbon energy sources remain in the interests of SRM researchers.

Geoengineering may be unique among recent emerging technologies for how the timescale in which it is will operate is intended to be finite.¹¹ Most advocates of geoengineering consider deployment a temporary measure until emissions have been reduced and some form of climate stabilization has occurred. David Keith, for example, has talked about using SRM to “shave the top off the curve” of rising global temperatures

http://www.decc.gov.uk/en/content/cms/about/science/activities/climate_change/ger/ger.aspx

¹¹ Christopher Preston, “Ethics and Geoengineering: Reviewing the Moral Issues Raised by Solar Radiation Management and Carbon Dioxide Removal,” *WIREs: Climate Change* (2012), doi: 10.1002/wcc.198

until greenhouse gases can be reduced.¹² If this is the intent of those who research geoengineering then the discussion of the conditions under which geoengineering would be deployed clearly needs to be supplemented by a discussion of the conditions under which it would be withdrawn. Under-discussed questions about cessation are as relevant as questions about deployment.

What is clear about SRM technologies is that in the absence of serious mitigation and adaptation efforts, *there simply isn't any prospect for cessation*.¹³ The masking of incoming solar radiation would have to go on forever if greenhouse gases continued to accumulate. Moreover, the masking would require increasingly large quantities of SRM as the radiative forcing created by ever-higher greenhouse gas concentrations increased. As already discussed, technologies to combat ocean acidification would have to be deployed and the political security necessary for a stable, long-term deployment would have to be established. Additional costs would quickly pile up. Mechanisms to compensate those harmed by precipitation changes associated with SRM would have to be created.¹⁴ The “incidental” effects of SRM deployments, including reduced solar photovoltaic generating potential, whiter skies, degraded astronomy, a damaged ozone layer, artificially red sunsets, the presence of permanent deployment infrastructure, and constantly changing weather patterns would all have to be deemed acceptable prices to pay.¹⁵

¹² This was a view Keith expressed at a University of Montana workshop in 2010

(<http://www.umt.edu/ethics/EthicsGeoengineering/Workshop/default.aspx>).

¹³ The case changes for CDR technologies.

¹⁴ Martin Bunzl, “Geoengineering Harms and Compensation,” *Stanford Journal of Law, Science, and Policy* 4 (2011), 70-76.

¹⁵ A. Robock, “Reasons Why Geoengineering May Be a Bad Idea,” *Scientist* 64 (2008), 14-18; C. Preston, “Ethics and Geoengineering: Reviewing the Moral Issues Raised by Solar Radiation Management and Carbon Dioxide Removal.”

There are some, apparently, who think nothing of these costs. The new age of the anthropocene, where humans extend their control over earth systems by intentionally altering fundamental global processes such as the climate, is viewed by some to be rife with opportunity. Earle Ellis enthusiastically subscribes, stating, “Creating the future will mean going beyond fears of transgressing natural limits and nostalgic hopes of returning to some pastoral or pristine era [...]. We must not see the Anthropocene as a crisis, but as the beginning of a new geological epoch ripe with human-directed opportunity.”¹⁶ Others demur. Maialen Galarraga and Bronislaw Szerszynski point out that “making climate” in this fashion will force us into unceasing and perhaps dangerous acts of creative endeavour.¹⁷ James Fleming’s history of attempts at weather modification is a reminder of the folly such activities tend to display.¹⁸ This list of requirements necessary for perpetual SRM is long and the costs are obviously high.

If the prospect of perpetual SRM is rejected then some serious planning for cessation—involving significant emissions reductions and perhaps even some carbon dioxide removal from ambient air—is required.¹⁹ If the cessation discussion is tied into

¹⁶ Earle Ellis, “The Planet of No Return,” *Breakthrough Journal* 2 (2011).

<http://breakthroughjournal.org/content/authors/erle-ellis/the-planet-of-no-return.shtml>

¹⁷ Maialen Galarraga and Bronislaw Szerszynski, “Making Climates: Solar Radiation Management and the Ethics of Fabrication,” In *Engineering the Climate: The Ethics of Solar Radiation Management*, edited by Christopher J. Preston, (Lanham, MD: Lexington Press, 2012) 221-235.

¹⁸ James Fleming, *Fixing the Sky: The Checkered History of Weather and Climate Control* (New York: Columbia University Press, 2010).

¹⁹ Carbon dioxide removal might in the process come to be viewed as a legitimate type of mitigation. See Clare Heyward, “Situating and Abandoning Geoengineering: A Typology of Five Responses to Dangerous Climate Change,” *PS: Political Science and Politics* 46 (2013), 23-27.

the deployment discussion, then those advocating for more SRM research are unlikely to be displaying quite the level of moral corruption that Gardiner fears. The moral corruption frame used in chapter 10 of *A Perfect Moral Storm* suggests that geoengineering advocates are ready to abandon all other climate strategies. The evidence suggests they are not. If geoengineering research were coupled with a comprehensive and serious discussion about cessation, then desire for SRM research may not display moral corruption but instead may be a genuine exploration of a safer path towards a low or zero emissions future.

The reason to make these points is not to shift the burden of proof-back onto those who would reject geoengineering. From the way the discussion of SRM appears to be going, it is clear that the burden remains very much on the shoulders of those who favor it, as indeed it should. The purpose is to re-examine the stigma of moral corruption that attends the discussion of geoengineering. Arguably, the idea that advocating for geoengineering research has an association with moral corruption has come with a political cost. Well-meaning researchers become defensive when it is suggested that their intentions are simply to avoid doing anything about emissions. This is regrettable when they seem to view their work as a genuine effort to help in the face of a situation that seems increasingly to be getting out of hand. While Gardiner's warning about moral corruption must be heeded, it should not drive the discussion.

There is, of course, a difficult catch-22 that the whole idea of moral corruption has created. Any attempt to acknowledge moral corruption and still talk seriously about geoengineering research might serve only to reveal how deeply corrupted the thinking about climate change has become. The second half of this commentary could certainly appear sadly symptomatic of a severe case of moral corruption and of reasoning that is badly diseased

and distorted. But, given the gravity of what is currently happening to the planet's climate, can we really be sure?

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SYMPOSIUM
A CHANGING MORAL CLIMATE



JUSTICE IN THE AUDITORIUM.
GARDINER'S THEORY OF
INTERGENERATIONAL JUSTICE

BY GIANFRANCO PELLEGRINO

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Justice in the Auditorium

Gardiner's Theory of Intergenerational Justice

Gianfranco Pellegrino

Stephen Gardiner's is destined to be a necessary reading for anyone interested in the ethics of climate change.¹ Gardiner filled a gap in climate ethics, and he did this in the most insightful way. His main effort was to provide a unified account of the ethical problems raised by climate change, assuming that by so doing climate ethics could be given a fresh (and better) start (xi, 3-4, 61-2). Gardiner's core assumption is that a given description of the problems people face when climate change is at stake will suggest a given view of the moral traits of the situation. From the description of the difficulties of the situation, conclusions about justice descend (4, 22-3, 43).² The book's central claims are that

¹ Stephen M. Gardiner, *A Perfect Moral Storm. The Ethical Tragedy of Climate Change* (New York: Oxford University Press, 2011). Unless otherwise specified, parenthetical references are to this text.

² Gardiner insists that the perfect storm is also a source of moral corruption (4, 13, 22-3, 45-8, 298, 301-338). Indeed, he sees unfairness as a core case of corruption (304). I shall not focus on this aspect, though, as it is considered in

- (i) climate change ethics faces three big problems,
- (ii) these problems reinforce each other, and
- (iii) their coexistence and reinforcement worsen the difficulties to any ethically-driven solution to climate change (6-8, 22-3, 47).

Gardiner drives our attention to the contrast between the interests of industrialized and developing nations in the present generations and the interests of the poorest nations, of poor citizens of developing nations and of future generations. Industrialized and developing nations gain in increasing their carbon-based consumption (thereby over-emitting), whereas poor nations and future generations would gain if the former group stopped their consumption (thereby mitigating present and future effects of climate change). Gardiner calls the conflict of interests between industrialized/developing and poor nations on one side and present and future generations on the other respectively the *global* and the *intergenerational storms*. The final problem he points at is the inadequacy of both our current political institutions and philosophical theories in dealing with the global and the intergenerational storms. This is the *theoretical storm* (6-7, 27-41, 108-9, 116-8, 123, 127-8, 213-19, 248).

Gardiner suggests that, in failing to cooperate, some of the participants in the global and the intergenerational storms inflict undeserved harms on others (7, 68). From the normative point of view, Gardiner attempts to take a neutral stance, on the assumption that a plausible view of the moral traits of climate change can be given without too many controversial assumptions (5, 7 fn. 9, 44, 155-6, 220 fn. 17). However, in his picture of the

a distinct comment in this issue (cf. Marcello Di Paola, *Climate Change and Moral Corruption*, in this issue).

intergenerational storm he relies on a conception of intergenerational fairness, as he repeatedly asserts that current generations are committing inexcusable and blatant wrongs toward future people, harming them in order to gain undue benefits (7-8, 143, 150, 158-60, 277).

In this comment, I shall contend that Gardiner's description of the intergenerational storm does not license his view of intergenerational fairness, and that this breaks the unity of the picture of climate ethics he provides. I shall claim that the most natural conclusion derivable from Gardiner's description is that our duties toward future generations are more *lenient* than are our duties toward people presently affected by climate change. Accordingly, if Gardiner's description of the intergenerational storm is right, as I believe it is, then his invocation of intergenerational fairness is unsupported. Gardiner's magisterial description of the problem of climate change shows that its solution relies not on justice or fairness, but at most on beneficence.³ Moreover, the problem of climate ethics is not a unified threefold storm, as Gardiner contends. We rather face divergent problems, and the theoretical storm is even worse than Gardiner admits—as we have also the problem of coping with different and not parallel issues. In Gardiner's hands, climate ethics is a serious, and theoretically elegant, issue. I am afraid that

³ I am here assuming a common sense distinction between issues of justice understood as questions concerning harms to be avoided and issues of beneficence understood as questions concerning goods to be promoted. Of course, this dichotomy can be challenged, or further developed in various directions. A similar distinction between issues concerning goodness or value and issues concerning justice is established in John. Broome, *Climate Matters. Ethics in a Warming World* (New York: Norton & Company, 2012), 12, 13-4. Notice that Broome suggests that governmental and collective action are aimed at 'doing the best thing—making the world a better place—', whereas only private morality, i.e. individual action, has justice as its aim (*ibid.*, 13). In a sense, I think my conclusions here aligns with Broome's view.

elegance will turn out to lie merely at the surface level, while the deep levels of the issue contain only hard problems.

My comment will proceed as follows. In § I, I will quickly reproduce Gardiner's account of the global and the intergenerational storm. In § II, I will give an alternative, but not divergent, description of the structure of the intergenerational storm. In § III, I shall contend that the intergenerational storm does not licence compelling duties of fairness towards future generations—indeed, it implies that we have more stringent duties toward present victims of climate change. Accordingly, Gardiner's description of the moral problem of climate change turns out to have unintended quietist results.⁴

I

For Gardiner, the global and the intergenerational storms encapsulate a contrast between the dictates of individual and collective rationality, a contrast consisting in the mutual opposition between the following couples of claims:

- (1) It is *collectively rational* to cooperate: each agent prefers the outcome produced by everyone cooperating over the outcome produced by no one cooperating.
- (2) It is *individually rational* not to cooperate: when each individual has the power to decide whether or not she will cooperate, each person (rationally) prefers not to cooperate, whatever the others do (26; see also 104-9).

⁴ Gardiner's book is immensely rich and detailed. For the sake of space, this comment will not focus on many of the topics deserving examination. However, I shall attempt to give full references to places where topics that can be substantial to my discussion are treated by Gardiner.

(1*) It is *collectively rational* for most generations to cooperate: (almost) every generation prefers the outcome produced by everyone cooperating over the outcome produced by no one cooperating.

(2) It is *individually rational* for all generations not to cooperate: when each generation has the power to decide whether or not it will cooperate, each generation prefers not to cooperate, whatever the others do (162; see also 36).

The consequence of the truth of the above claims is a “paradoxical” situation, Gardiner remarks: “each agents [and almost each generation] accepts that it is *collectively rational* to cooperate; but [...] each agent [and each generation] believes that it is *individually rational* not to cooperate.” The tragedy comes from a dominance of individual rationality, which leads to a suboptimal outcome and to a failure of collective rationality (27-8, 104, 181). The paradox instantiated in the global and the intergenerational storms becomes manifest in the sphere of climate change mitigation. Even though no country wants climate change, each nation prefers not curbing its own emissions and letting other do the necessary cuts; accordingly, no one will accept cuts in emissions rates. Moreover, the present generation prefers gaining from over-emission rather than losing because of cuts on emitting activities. Any of the following generations will have the same preference. Accordingly, over-emission will be iterated across generations (28, 35).

Gardiner emphasizes differences between the intergenerational and the global storms. In intergenerational cooperation, the claim about collective rationality (1*) is less general and more unstable than the corresponding claim (1) in the global storm. The first generation able to over-emit (hereafter *the first generation*) has no incentive to cooperate, because it gains nothing from the cooperation of successive generations, nor does it share the costs of over-emission, which are passed onto future generations. As a

consequence, for the first generation cooperation is pure sacrifice. Moreover, if and when the first generation fails to cooperate, this fixes the incentives of any subsequent generation (hereafter the *later generations*). Accordingly, Gardiner concludes, “the defection of the first generation is enough to unravel the entire scheme of cooperation” (37-8), and the buck-passing will be iterated, bringing about increased and cumulative effects and worse impacts for more distant generations, which will be forced to pay compounded costs from the defection of earlier generations (153; see also pp. 35-9, 43-45, 47, 123, 148-50, 153-4, 160-64, 201-3, 266).

In addition, none of the usual solutions to similar *intragenerational* dilemmas are available in the *intergenerational* case. No reciprocity reasons, provided by wider and iterated contexts, are available; and neither are institutional solutions.⁵ Accordingly, the dominance of individual reasons to defect is even stronger in the *intergenerational* than it is in the *intragenerational* case (37). In the latter, reasons in favour of individual defection are contingent on the present state of incentives, which can be changed through institutional or interactional solutions. By contrast, in the former individual reasons to defect are not contingent, as when it is its turn to decide whether to cooperate or not, each generation is not subject to any reciprocal retaliation on the side of its predecessors (163; see also pp. 37-8, 50 fn. 1, 76, 106 fn. 6, 115-7, 213).

Gardiner points out that the *intragenerational* and the *intergenerational* storms produce unfairly distributed losses (118-

⁵ To be true, Gardiner is clear on the fact that even in the global storm, i.e. in the *intragenerational* case, current institutions are unable to do the required task. However, it seems that in the *intragenerational* case better institutions are possible, whereas in the *intergenerational* case institutions are unable to do the trick, especially with not overlapping generations (at 28-9, 435).

23, 242). For instance, surely in industrialized countries poor people have experienced heavier adverse effects from climate change-driven extreme climatic events.⁶ Likewise, poor citizens of developing countries suffer more from present impacts of climate change. As a consequence, in the global storm a failure of rationality leads also to a failure of morality—someone’s failure to act rationally is also a cause of harms for others. For the ruling elites of industrialized countries, failure to mitigate climate change is both a long-term irrational behaviour and a wrong, being a cause of serious harms to vulnerable people. Similar circumstances obtain in the intergenerational storm, where later generations suffer from harms produced by the self-interested behaviour of previous generations, thereby progressively lowering the overall well-being across generations (see pp. 31, 38).

II

Gardiner claims that current behaviour in the face of climate change is driven by a self-defeating view of practical reasons (56-7).⁷ He suggests that failure in seriously cutting greenhouse emissions is a failure of rationality, because when everyone fails to do so, everyone gets less (27-9). In failing to cut their own emissions, even industrialized countries and their ruling elites get less, because of the impact that ongoing climate change has even on them—as it is confirmed by increases in storms and heat-

⁶ On the connections between climate change and extreme events, see Marten K. van Aalst, “The impacts of climate change on the risk of natural disasters,” *Disasters* 30 (2006), 5-18; P.J. Webster, G.J. Holland et al., “Changes in Tropical Cyclone Number, Duration, and Intensity in a Warming Environment,” *Science* 309 (2005), 1844-46.

⁷ On self-defeating views of practical reasons, see Derek Parfit, *Reasons and Persons* (Oxford: Clarendon Press, 1984), Part I.

waves in many Western countries.⁸ Moreover, recurrent food crises can be evidence that also for developing countries climate change's effects can outweigh the gains of economic development⁹. As a consequence, when everyone fails to cut emissions in order to gain from carbon-based activities, everyone gets less on the whole, and everyone loses more than the losses produced by cutting emissions.

In the intergenerational case things are different. It is not the case that when each generation acts in pursuit of its generation-indexed interests, each generation gets less. Each generation has the possibility to pass on the costs of over-emission to future generations, guaranteeing for itself only the gains of industrialization. In the intragenerational storm, no one can maximize her gain if everyone acts as a maximizer, but everyone maximizes if everyone acts as a non-maximizer. Accordingly, in the intragenerational interaction maximization is *indirectly reachable*, i.e. it can be reached if everyone avoids its direct pursuit.¹⁰ By contrast, in the intergenerational storm each generation can maximize its gains even when everyone acts as a maximizer. However, each generation (except for the first) inherits from its

⁸ See IPCC, "Summary for Policymakers," in T.F. Stocker et al., *Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* (New York: Cambridge University Press, 2013). However, if national impact is at stake, it is not clear which nations will be adversely affected by climate change, and it may be the case that specific parts of the world will even gain from climate change. This exacerbates the global storm, as Gardiner emphasizes at 29-30.

⁹ See Molly E. Brown and Chris C. Funk. "Food Security Under Climate Change," *Science* 319 (2008), 580-1, Munir A. Hanjraa and M. Ejaz Qureshib. "Global water crisis and future food security in an era of climate change," *Food Policy* 35 (2010), 365-77.

¹⁰ On indirect theories of rationality and morality, see R.B. Brandt, "Fairness to Indirect Theories in Ethics," in Id. *Morality, Utilitarianism, and Rights* (Cambridge: Cambridge University Press, 1992), 137-57.

predecessor’s substantial losses, which diminish its aggregate well-being. Nevertheless, for each generation is better to increase its emissions as much as possible, as doing otherwise would add to the already existing losses inherited from the past. So, for each generation cutting emissions would be suboptimal, and the only way to maximize is through the highest emission rate. Accordingly, each generation’s maximization on the whole produces a suboptimal, and decreasing, trend, as each generation’s maximum—after the first generation—is inferior to its predecessor’s maximum. As the generations go on, each generation’s quality of life diminishes, whereas each generation’s emissions increase. The overall well-being of generations, then, is suboptimal, i.e. it is inferior to the well-being that generations would have enjoyed had the first generation cut its consumption. However, each of the generations gets the maximum *it could have*, if because there is no way to access a world where its maximum is greater. Here’s a representation of this dynamic for seven not overlapping generations:

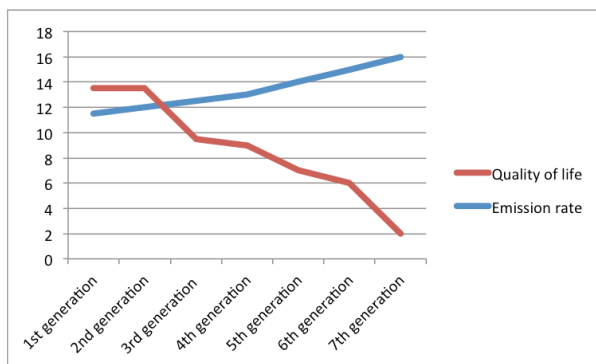


Fig. 1: trends of quality of life and emissions rate across not overlapping generations¹¹

¹¹ Notice that in framing Figure 1, and in the following figures, I am assuming: i. an arbitrary zero level; ii. that by over-emitting, each of the generations

In the intragenerational case two possible worlds are equally accessible, i.e. they can both be made actual—in one world no one maximizes, and thereby everyone gets the maximum (call this the *maximal world*); in another world, everyone maximizes, and for this reason no one gets the maximum (call this the *maximizing world*). Both worlds are equally accessible to everyone, but no one knows which of them is actual. They are *metaphysically accessible*, but *epistemically inaccessible*. Each person thinks in the following way: ‘I do not know in which world I am living. Suppose I am in the maximizing world. If so, it is better for me to maximize, as there is nothing I can do to actualize the maximal world, and by failing to maximize I would get less than what is available. Suppose instead that I am in the maximal world. If so, it is better for me to maximize, thereby getting an extra gain. But as everyone thinks this way, the maximizing world is made actual. Obviously, if for whatever reasons everyone decides not to maximize, then the

increases its level of quality of life, as compared to successors, and simultaneously decreases it, as compared to predecessors; iii. that sudden, non-linear, falls of the level of quality of life obtain as the emission rate grows, due to the overcoming of various tipping points in the effects of greenhouse gas concentration on the whole system of Earth climate. These assumptions are grounded on predictions contained in IPCC, “Summary for Policymakers”. On tipping points, see pp. 39, 100-1, 112, 186-91, 201-2, 222-3; see also Malcolm Gladwell, *The Tipping Point. How Little Things Can Make a Big Difference* (Boston: Little, Brown & Company, 2000), Peter U. Clark, Nicklas G. Pisiias, Thomas F. Stocker, and Andrew J. Weaver, “The Role of the Termohaline Circulation in Abrupt Climate Change,” *Nature* 415 (2002), 863-9, Michael D. Mastandrea and Stephen H. Schneider, “Integrated Assessment of Abrupt Climatic Changes,” *Climate Policy* 1 (2001), 433-49, Mike Hulme, “Abrupt Climate Change: Can Society Cope?” *Philosophical Transactions: Mathematical, Physical and Engineering Sciences* 361 (2003), 2001-21, Timothy Lenton et al., “Tipping Points at the Earth’s Climate System,” *Proceedings of the National Academies of Science* 105 (2008), 1786-93. Assumption ii. above encapsulates the evolving aspects of the climate change tragedy (at 110-12). See also pp. 200-3.

maximal world becomes actual.¹² Accordingly, the maximal world is epistemically inaccessible, but not *practically* so. In any moment, it would be possible to make it actual. Hence, the outcome produced by everyone maximizing is suboptimal: it is inferior to the outcome produced by everyone cooperating. Institutional solutions, and other ways to change incentives, are tools able to induce people to avoid maximizing conduct, thereby actualizing the maximal world.

In the intragenerational case, the maximal and the maximizing worlds are simultaneous. At each point on the time curve, everyone can actualize either one of them. In the intergenerational case, there might be two worlds, too, and they run parallel to those appearing in the intragenerational case. First, there is a world where each generation restraints its maximization, by cutting its emissions (call this the *maximal** world). Second, there is a world where the first generation over-emits, and later generations continue the trend. In the latter world, the compounded losses cumulate across the generations, thereby causing a decreasing trend of the quality of life (call this the *lowering-maximizing* world). Here is a representation of the two worlds:

¹² Of course, if someone decides not to maximize, this is not enough to actualize the maximal world. On the structure of this situations, see D. Parfit, *Reasons and Persons*, 59-110, 382-4, 524-5.

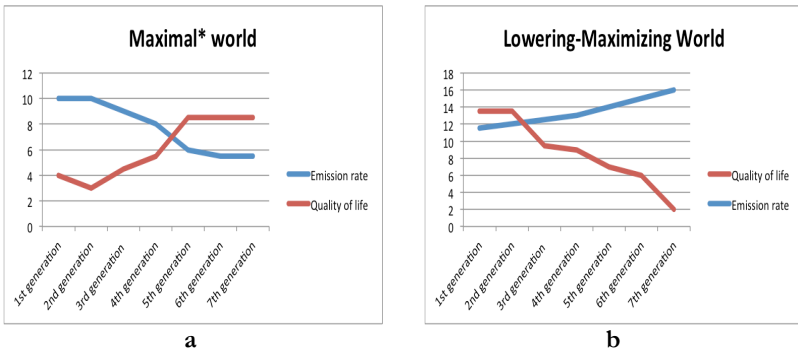


Fig. 2: a two-worlds representation of the intergenerational storm¹³

As generations are placed at successive points in time, each generation might have its world fixed by the choices of its predecessor. A generation succeeding a generation that actualized a maximal* world can either replicate the non-maximizing behaviour of its predecessor, or maximize. The first choice would make the maximal* world last one more generation. The second choice would put an end to the maximal* world and give rise to a lowering-maximizing world—indeed, this would be a *mixed world*,

¹³ Notice that in Figure 2 various discontinuous fallings and risings of quality of life are assumed. In particular, in the lowering-maximizing world quality of life can collapse rapidly due to the overcome of tipping points in the dynamics of climate change (this is what is posited in the assumption iii. presupposed in Figure 1 and stated in fn. 11 above), whereas in the maximal* world avoidance of those catastrophic changes in climate can represent substantial, incremental, and non-linear improvement of quality of life. In the diagrams, both collapses and improvements of quality of life obtain from the fifth generation onwards. Moreover, it is assumed that improvements of quality of life will be less drastic, and smaller, than collapses. This corresponds to the idea that the worst effects of climate change will produce substantial suffering, as compared to the initial conditions, whereas avoiding these effects will guarantee security and maintenance of levels of well-being only mildly superior to the initial conditions.

beginning with a not maximizing generation and going on with maximizing ones. By contrast, when it succeeds a generation that actualized a lowering-maximizing world, a generation cannot actualize a maximal* world. Even if this generation decides to cut its emissions, the world in which it lives is already wretched by its predecessor's emissions. The only rational choice, for such a generation, is to continue the maximizing behaviour of previous generations. Accordingly, mixed worlds can only be worlds beginning as maximal* ones and turning into lowering-maximizing ones. In Figure 2, the second generation in diagram **a** succeeded a maximizing generation, and has no choice but continuing to maximize. (By contrast, the second generation in diagram **b** succeeded a not maximizing generation and chose to follow that trend, thereby creating a maximal* world).

Here's the representation of mixed world:

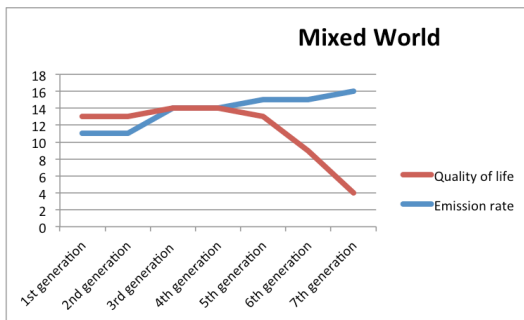


Fig. 3: A mixed world

For each generation living in a lowering-maximizing world, maximal* worlds can be *metaphysically* inaccessible. While moves from maximal* to lowering-maximizing worlds are possible, it is impossible to go from a lowering-maximizing world to a maximal* one—mixed worlds begin with not maximizing

generations (able to create maximal* worlds) and go on with maximizing generations (who make actual lowering-maximizing worlds). Let's call this way of framing the intra- and the intergenerational storms the *two-worlds story*.

Our actual world is a lowering-maximizing one: as many previous generations have over-emitted, and have done so despite awareness of the harms connected to over-emission, present and future generations cannot accede a maximal* world. As a consequence, the moral assessment of a lowering-maximizing world is the only relevant issue in intergenerational climate ethics.

III

In a lowering-maximizing world, cooperation—i.e. the maximal* world—is metaphysically inaccessible. In a lowering-maximizing world maximization is not a suboptimal strategy—even though it is a strategy leading to a decreasing maximum. If so, whereas in the intragenerational case a failure of rationality amounts to a moral fault, in the intergenerational case there is no failure of rationality at all. In lowering-maximizing worlds rationality and morality diverge. An over-emitting behaviour is not irrational, even though it causes unfair harms on later generations. Accordingly, unfairness—and moral fault in general—are not consequences, or counterparts, of failures in practical rationality. In lowering-maximizing worlds, over-emitting generations cannot be accused of irrationality or self-contradiction.¹⁴

However, it might be argued that even in a lowering-maximizing world a rational but harming behaviour is immoral.

¹⁴ Gardiner acknowledges this at 162-3.

In deciding to actualize a lowering-maximizing world, the first generation harms later generations, because in a maximal* world later generations would have been better off than they are in a lowering-maximizing world. (In Figure 2, diagram **b**, later generations are better off than are later generations in Figure 3.) In a lowering-maximizing world later generations are worse-off because of a choice made by the first generation. This generation could have caused them to be better off. As a consequence, they have been harmed by the first generation. By contrast, later generations are not causally responsible for the fate of their successors—as this fate has been fixed, as it were, by the first generation. Accordingly, they are not harming their successors.

Consider the *Auditorium Dilemma*:

If the First Row stands, it will improve its view of the engrossing spectacle on stage. If it is worth standing to get this better view, it will be better for the First Row if it stands. But this would block the Second Row's view. This Row would need to stand to regain the view that it had when all were sitting. Since it would now be standing, but would not have improved its view, this outcome would be worse for the Second Row. Similar remarks apply to all the other Rows.¹⁵

People in the first row may either stand or sit down. In choosing to stand, they harm people in the other rows—because those people will have a worse view. What about the second row? It may either stand or sit down, too. By choosing to stand, it will come back to the initial condition—people in this row will see how they would have seen had the first row sat down. The third row people can choose to stand as well, in order to restore their original condition—i.e. the visibility they would have had had the first row sat down. And so on.

¹⁵ D. Parfit, *Reasons and Persons*, 524.

It might be argued that as the first row harms the second row by choosing to stand, similarly the second row harms the third row, and so on. But this cannot be true, because the alternatives available to the first row are different ones. The first row can choose either to stand or to sit down. If they choose to sit down, the view of the other rows is the best available—i.e. it is the best in the conditions given.¹⁶ When they choose to stand, they worsen the view of the other rows—making it less than best, i.e. suboptimal. This is not true of the rows from the second one

¹⁶ Some particulars need to be settled. The goodness of the view of the rows other than the first depends on the shape of the auditorium and the position of the stage. If the auditorium is of the amphitheatrical kind—with rows placed at different heights and in a circular arrangement –, then it might be supposed that when all the other persons sit down *each* person in *each* row has the same quality of vision. If the auditorium is of the ordinary kind, then people in the rows other than the first can have a progressively worse view. I shall assume that Parfit does not refer to an amphitheatrical auditorium, as in this kind of structure even with the first row standing, the view of the other rows will be worsened in decreasing degrees—indeed, as the distance from the first row increases the view improves. In contrast, in an ordinary theatre the first row worsen the view of each of the other rows. To be true, both representations can be inaccurate. Climate change has both *continuous* effects, effects that can be prolonged by inaction of the first generation but tend to decrease, and *jumping* effects, as it were, effects that affect distant generation once a given threshold is overcome, while proximal generations are spared. Neither the amphitheatrical auditorium, nor the ordinary one can accurately represent both these effects. Here, I shall not consider further this point. Gardiner considers these two kinds of effects at pp. 40-1 (at 101 he seems to be skeptical on the relevance of tipping points in climate change ethics; however, he qualifies this position at 183-203, 224-30). I am assuming that the fact that the first row stands creates a harm on the other rows that even though decreasing (if the auditorium is amphitheatrical) cannot be cancelled. This amounts to assuming that some of the effects of climate change—for instance extinction of certain species—will be permanent and irreversible. If this is the case, an ordinary and an amphitheatrical auditorium are equivalent, as it were: when continuous effects are not at stake, then jumping effects are to be considered, and vice versa. This is the reason why in the text I do not consider further this issue.

onwards. If people in the second row choose to sit down they will have a worse view than they would have by standing. In this respect, their condition is similar to the first row people. But if the second row audience chooses to stand this does not harm (i.e. *it does not make worse*) the third row's view, because the third row is already seeing worse *because of* the first row's choice to stand. The first row's choice worsen the view of *each* of the other rows, while the choices of each of the other rows have no impact on the succeeding rows. The harm produced by the first row spreads over each of the other rows.¹⁷

Accordingly, each of the rows except the first does not harm their successors—at least not in the sense of making them worse off. In a sense, each of the rows except the first is metaphysically necessitated to not making any difference in the predicament of their successors. In the terminology employed in the two-worlds story, once the first row decided to stand, the world where each of the rows sees at its best is metaphysically inaccessible. It seems pointless to ask them to act otherwise—i.e. to sit down—in order to produce a better outcome—i.e. in order to give a better view to the other rows. For in the worlds accessible to them, no better outcome is achievable—once the first row stood, no better view

¹⁷ It might be claimed that the first over-emitting generation cause harms impacting on distant generations—namely, harms whose bad effects jump some near cohorts and impact on distant generations, harms whose bad effects are jumping effects (see fn. 16 above). This might depend on tipping points to be overcome, and to non-linear effects of climate change (on this, see the references in fn. 11 above). I do not see how this might change substantially the points made in the main text. The only consequence of this alternative view of how harms of over-emission spread is to postpone the very moment when a generation is forced to over-emit to cope with its inherited burdens. In that moment, the intergenerational dynamics considered in the text obtains—the first generation harms later generations, which in their turn over-emit to recover the inherited losses.

is possible for the other rows. The state of affairs where all the rows have a better view is metaphysically inaccessible.

For similar reasons, each of the later generations in a lowering-maximizing world cannot be demanded to abstain from maximization. They could be so demanded if their abstention would produce the best outcome. But each of the worlds where their abstention would have this result is metaphysically inaccessible for them. It might be objected that if any of the later generations would abstain from maximization, this would avert losses to its successors—even though the successors must still incur some of the losses coming as a consequence of the first generation's over-emission. Accordingly, the objection continues, each of the later generations may be demanded to abstain from maximization, as this would relieve its successors from some burdens.

This objection can be answered. Demanding each of the later generations to abstain from maximization for the sake of its successors cannot be a request of fairness, but rather a duty of beneficence. Fairness is not realized if any of the later generations takes on itself losses coming from the first generation and some of the losses that its successors would bear as a consequence of the first generation's over-emission. Rather, this would produce an uneven and unfair distribution of burdens among generations, where substantial sacrifices of earlier generations would be asked in order to relieve losses for later generations. This cannot be a fair intergenerational distribution of the burdens deriving from the first generation's over-emitting.¹⁸

¹⁸ Gardiner comes near to acknowledging this point in Stephen M. Gardiner, "A Contract on Future Generations," pp. 110-12, in *Intergenerational Justice*, ed. A. Gosseries and Lukas H. Meyer (Oxford: Oxford University Press, 2009), 77-118.

If the two-world story and the auditorium dilemma are reliable representations of the structural features of the intergenerational storm, then intergenerational fairness cannot be demanded of later generations. More precisely, only the first generation able to over-emit can be asked to be fair towards the later generations, i.e. to abstain from any action leading to harm. But once the first generation decided to harm the later ones, whatever its successors do is morally permissible—at least in terms of fairness. Since the initial generators of climate-change-inducing over-emissions are now past generations, Gardiner’s picture of the intergenerational storm implies that nobody can be accused of being unfair now, and that nobody could be so accused in the future.

If the above reasoning is sound, it turns out that Gardiner’s description of the intergenerational storm has the unintended effect of fuelling some skepticism towards intergenerational climate ethics. In the intragenerational case, reluctant nations can be charged of being collectively irrational (because their cooperation would make the overall world better off), as well as unfair (because their actual conduct harms developing and poor nations). By contrast, in the intergenerational case, later generations cannot be charged either of irrationality or of unfairness, because they are not guilty of harming their successors—at least in the sense that each generation is metaphysically unable to produce an outcome where its successors are not worse off. Henceforth, it seems that each of us—as an individual citizen of a developed or developing nation—has more stringent duties towards present victims of climate change than towards future generation. Not only the structural parallel between the intragenerational and the intergenerational storm fades away, but the moral consequences of such a parallel also vanish. While the intragenerational storm is a firm ground for advocating global fairness in dealing with the costs of climate change, the intergenerational storm is better

passed unnoticed, as it would legitimize a strong preference for the present at the cost of future generations. The intergenerational storm can at most ground duties of beneficence towards future generations, and these duties—one can assume—are less stringent than duties of fairness or of corrective justice.

If so, Gardiner's overall project appears to be seriously weakened. There is no common core for climate ethics. Whereas intragenerationally we face a contradiction within practical rationality, and this contradiction can ground duties of justice, intergenerationally we seem to face the absence of grounds for claims of justice in favour of future generations. Possibly, the theoretical storm is even deeper than Gardiner allows, because we are faced with scattered problems, rather than common issues in different fields. But the overall storm is surely less than perfect.

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SYMPOSIUM
A CHANGING MORAL CLIMATE



CLIMATE CHANGE
AND MORAL CORRUPTION

BY MARCELLO DI PAOLA

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Climate Change and Moral Corruption

Marcello Di Paola

Stephen Gardiner's *A Perfect Moral Storm* is a thorough and penetrating diagnosis of the challenges that global climate change poses to our political, economical, social, scientific, and moral systems. It is also an illuminating elucidation of some important reasons for our failure to address the problem.

My thesis is this. The peculiar features of the climate change problem pose substantial obstacles to our ability to make the hard choices necessary to address it. Climate change is a perfect moral storm. One consequence of this is that, even if difficult ethical questions could be answered, we might still find it difficult to act. For the storm makes us extremely vulnerable to moral corruption (22).¹

In this piece, I comment on the notion of moral corruption. In particular, I discuss the issues of who is susceptible to it (§ 1), and of what sort of problem moral corruption is (§ 2).

¹ Stephen Gardiner, *A Perfect Moral Storm. The Ethical Tragedy of Climate Change* (Oxford: Oxford University Press 2012). Unless otherwise specified, parenthetical references refer to this text.

I

Patterns of Agency

Not only in the quote above, but throughout the book, Gardiner makes a somewhat casual use of the terms “we,” “us,” “our,” etc. Depending on context, “we” comes to mean individuals (58); present generations or “current populations” (38); the affluent of present generations (6); “our (largely national) institutions,” and more generally “the current global system” (29); humanity at large (3-4); but also all “morally serious people” (5); and all moral agents whatever (11).

There could be at least two reasons for such latitude. First, when it comes to climate change, agency is causally and spatiotemporally fragmented (24-28): all are implicated, and “We” is sure not to leave anyone out. Second, Gardiner is interested not in “the question of the relative contribution of different agents, or the causal influences operating between them,” but rather in uncovering “underlying structural patterns of agency” (59, note 12). As it becomes clear (58-59), he refers to structural *motivational* patterns.

In conclusion, my key motivational claim is that, other things being equal, the decisions that cause climate change are driven by concerns with very limited spatial and temporal horizon. Unfortunately, this assumption (applied to individuals, businesses, and governments) seems both perfectly realistic in the world in which we live, and more than sufficient to generate the perfect moral storm (60).

“We,” then, comes to designate a form of agency that is causally and spatiotemporally fragmented, but whose underlying structural pattern, at least at the level of motivation, is basically one. Because this pattern no less than “generates” the perfect moral storm, on it “some kind of intervention (e.g. by governments, or individuals and firms themselves) is necessary to avoid a moral disaster” (63). Said intervention should “engage

motivations with a longer time-horizon and wider purview, including moral motivations such as those for intergenerational justice and respect for nature” (61).

Gardiner’s basic motivational claim, though realistic indeed, obscures some morally relevant facts. Even granting that all agents share the same, spatiotemporally limited basic motivational pattern, and that such pattern generates the perfect moral storm, different agents may be more or less morally justified in relying and holding on to it. Specifically, while it is true that businesses and governments are moved by spatiotemporally limited motivations, there are substantial moral considerations justifying that. Businesses are obligated to their living shareholders, first and foremost; governments are obligated to their living citizens, first and foremost (and plausibly, but already less stringently, to the next couple of generations of their future citizens—that being still quite far from the sort of spatiotemporal expansion Gardiner is calling for). Of course, there are familiar arguments to the effect that both businesses and governments should adopt a (much) more expansive moral perspective—but these arguments are far from uncontroversial, infested by assurance problems, and often fragile when pushed into tight corners. Understandably, Gardiner does not undertake a thematic venture in their favor. Absent that, however, we have no conclusive grounds for declaring the limited motivational patterns of businesses and governments to be morally unjustified: and that weakens the request that they be expanded.

The situation may be different with individuals. Their spatiotemporally limited motivational patterns, though perfectly understandable psychologically—after all, our motivational apparatus has evolved in response to problems mostly unfolding in the “here and now”—are much harder to justify morally, as individual morality is widely held to be an impartial exercise, and

that means also spatiotemporally impartial. The claim that agents should embrace spatiotemporally expansive moral motivations may thus have a chance at being immediately authoritative if these agents are understood to be *individuals*. The question would then follow, as to where these motivations should come from. The most obvious source would be moral obligations. However, it remains unclear whether individuals have moral obligations against climate change.² It is also unclear who, or what, should be

² On this topic see, among many others, Walter Sinnott-Armstrong, “It’s Not My Fault: Global Warming and Individual Moral Obligations” in *Perspectives on Climate Change*, edited by W. Sinnott-Armstrong and R. Howarth (Amsterdam: Elsevier, 2005), 221–253. Sinnott-Armstrong argues that no individual has a moral obligation to take unilateral, self-starting action against climate change, because no individual is personally responsible for climate change (and the harms it will bring), and that in turn because no isolated individual has made or can make any significant causal difference to it (negative or positive). The conclusion is that individuals must delegate the matter to governments—as governmental action has made and can make a difference—and do so *effectively*: they must make sure that governmental action makes a *positive* difference, by voting appropriately, protesting, monitoring, lobbying, and the like. Sinnott-Armstrong thinks of such forms of political engagement as *moral* obligations because, as a consequentialist, he thinks of them as specific verdicts of the general consequentialist obligation every individual always has—that of making things best overall. Gardiner’s own view on this topic picks up on Sinnott-Armstrong’s gesture at political engagement, but loses the consequentialist rationale for it. His proposal is that anti-climate change individual obligations can be salvaged by focusing directly on political rather than moral responsibility. The reasoning goes like this: individuals delegate to governments in many cases—particularly in those cases that either cannot be addressed or would only be poorly handled at the individual level (complex collective action problems such as security provision, for instance). But sometimes governments fail to do their job, and that is to say that the delegation itself has failed. In such cases, says Gardiner, “the responsibility falls back on the citizens, to either solve the problems themselves or, if this is not possible, to create new institutions to do the job. If they fail to do so, then they are subject to moral criticism for having failed to discharge their original responsibilities” (p. 403). But what are these “original responsibilities” that

the addressees of such obligations.³ Gardiner says our theories on these matters are “underdeveloped” (7), implying that work can be done to better align their verdicts to the hitching moral inkling

“fall back” on the citizens, and where are they coming from? In other words, what can so authoritatively stop individuals, once anti-climate change delegation has failed, from just letting the whole thing go? Is it the mere fact that some *other* delegation was at some point made? This seems rather peculiar. There must be independent reasons why delegating, and ensuring the effectiveness of the delegation, is (and was) important in its own right: and one suspects these must be *moral* reasons (not a particularly imaginative suspicion, since Gardiner himself says that the sort of criticism citizens will be subject to if they fail is specifically moral). From Gardiner’s argumentation, it transpires less clearly than it does from Sinnott-Armstrong’s whether these reasons descend from a general consequentialist obligation to make things best overall. I doubt that this is Gardiner’s position. So the “original responsibilities” he refers to must come from elsewhere. One possibility is that there is a non-consequentialist moral obligation to delegate effectively, which is as general and as powerful as its consequentialist counterpart. This may be Gardiner’s view, but it is not explicitly laid out in the book. Another possibility, coming back full circle, is that the “original responsibilities” in question stem from individuals being indeed responsible for climate change in the sense that *it* (not just their failed delegation against it) is their “fault,” in Sinnott-Armstrong’s meaning of the word. But this would of course resurrect the problem of how one can be morally responsible for some outcome, if one has made and can make no difference to it. On this point, see Marcello Di Paola, “Who Does What, Why, and How,” in *Canned Heat: the Ethics and Politics of Global Climate Change*, edited by Marcello Di Paola and Gianfranco Pellegrino (Delhi: Routledge Publishing, 2014), 144-159.

³ Parfit’s non-identity problem undermines the very idea that we can do wrong to future generations—see Derek Parfit, *Reasons and Persons* (Oxford: Oxford University press, 1984), chapter 16. As for our obligations to nature, or elements thereof (e.g. plants, species, landscapes, ecosystems), the many attempts at establishing their moral considerability have, for different reasons, been largely unsuccessful (one notable exception being the case of animals). If such elements have no moral standing, then they cannot even count as legitimate addressees of any moral obligations at all. These are open issues—for a review of relevant arguments see Dale Jamieson, *Ethics and the Environment* (Cambridge: Cambridge University Press, 2008), chapters 3, 5, 6.

that we (individuals) *must* have *some* obligations towards those (human and non-human) we can so deeply harm through climate change. No doubt our theories are underdeveloped: however, it cannot be assumed that developing them will give us the answers we want. For all we know, it might just confirm that our itching moral inkling is simply misguided.

That does not have to be the end of the story, however. If morality fails, maybe ethics can do the trick.⁴ Perhaps, the motivations that we need will come from a self-starting individual *resolve* to contrast climate change, *irrespective* of whether one has a moral obligation to do so. Resolves are freely adopted intentions, which regiment one's behavior to a freely adopted course of action. One may make all sorts of resolves for all sorts of reasons: I might resolve against climate change out of perfectionist or aesthetic reasons, for instance, or even out of spite, caprice, or a cheerful sense of revolt.⁵ What is distinctive of resolves is not the sorts of reasons grounding their adoption, but the fact that their adoption entrenches such reasons, whatever they may be. Resolves are intentions especially designed to stand firm in the face of contrary inclinations and/or dissonant information; and their pursuit is non-contingent on the behavior of others. In

⁴ Gardiner often uses “moral” and “ethical” interchangeably, too. I think it better to distinguish clearly, if only roughly. Morality concerns our treatment of others, and speaks the language of obligation. Ethics, on the other hand, has to do with our own character, with the way we look at the world as well as ourselves and our place in it, with how we choose to live our lives and what is important to us—with “who we are.” Ethics speaks the language of virtue.

⁵ See Marcello Di Paola, “Virtues for the Anthropocene,” *Environmental Values*, forthcoming.
<http://whpress.co.uk/EV/papers/Di%20Paola.pdf>.

model cases, having resolved in favor of a certain course of action, I simply avoid reconsidering my stance.⁶

The pursuit of resolves is always a matter of character and strength of will, not duty. That gets us closer to the domain of virtue theory.⁷ That virtues rather than obligations are in the background of Gardiner's thought is revealed by Gardiner himself in the following passage:

[...] what might broadly be called virtue theory [...] seeks to identify the characteristic "temptations" present in certain situations, positions, or ways of life, where these are understood as vulnerabilities to behaving badly to which many are likely to be susceptible. Such work is helpful not only for thinking about how to resist acting badly, but also in coming to understand ourselves as moral agents. "Who we are," morally speaking, is a significant ethical issue, and one which [...] has considerable bearing on the global environmental tragedy (4).

Gardiner connects virtue with the capacity to resist temptations. He also tells us that analyzing the sort of temptations to which we are susceptible helps us understand ourselves as moral agents. Such talk of temptations, resistance, and self-understanding again seems to indicate that, with the terms "we," "us," "our," etc., reference is being made not to all agents but to individuals specifically (in particular to presently living, affluent, "morally serious" individuals). It is individuals that must engage different motivations; and it is individuals who are susceptible to moral corruption.

⁶ See Richard Holton, *Willing, Wanting, Waiting* (Oxford: Oxford University Press, 2009), for an extended discussion.

⁷ Though, of course, the connection between resolves and virtue development and exercise needs much more detailed unpacking, which I cannot provide here.

II

Moral Corruption

In an important passage, Gardiner writes:

If we are tempted by buck-passing, but reluctant to face up to moral criticism for succumbing to it (our own, or that of others), we are likely to be attracted to weak or deceptive arguments that appear on the surface to license such behavior, and so to give such arguments less scrutiny than we ought. A particularly deep way of doing this is through the corruption of the very terms of the debate [...] Given this, it becomes even more necessary than usual to be vigilant about our own reasoning. Unfortunately, addressing corruption of the understanding is not easy (302).

Moral corruption is corruption *of the understanding*, of the way we think and talk of climate change (we must “be vigilant about our own reasoning”).⁸ Gardiner develops and illustrates this idea by discussing the case of John Dashwood, a character in Jane Austen’s *Sense and Sensibility*. Having promised his dying father that he shall use part of the inheritance to take care of the economic wellbeing of the women in the family, John quickly loses his resolve under the influence of his wife Fanny’s morally twisted arguments.

In my opinion, Gardiner’s characterization of moral corruption risks obscuring an important part, if not the actual

⁸ Though Gardiner provides a number of characterizations of moral corruption at the beginning of chapter 9 (pp. 303-307), some of which are not reducible to “corruption of the understanding,” he effectively restricts his focus on the latter throughout the rest of his exposé. He also takes a revealing Kantian angle when actually defining moral corruption (p. 307): “The thoughts that I take from Kant are...that moral corruption is: (a) a tendency to rationalize, which (b) casts doubt on the validity and/or strictness of moral claims, by (c) seeking to pervert their status and substance, and in doing so (d) aims to make those claims better suited to our wishes and inclinations, and (e) destroys the characteristics in virtue of which we respect them.”

nature, of the ethical enterprise individuals must confront when acting against climate change. There are numerous ways in which the analogy drawn between the case of John Dashwood and “ours” is imperfect, as Gardiner himself admits. But one is particularly relevant for my purposes—and, peculiarly, it is one that Gardiner explicitly excuses, even denies. While Dashwood has promised his father to take care of the women in the family, *thus* contracting an obligation, there obviously exists no promise that “we,” as individuals, have made to the effect that we shall take care of the spatiotemporally distant or the rest of nature. And here Gardiner makes a peculiar move, which suddenly factors out the theoretical storm he has himself so clearly denounced. He says: “The normative authority of this promise plays a role similar to that of norms of global and intergenerational ethics in the perfect moral storm” (312). He does recognize that “John makes an explicit commitment to aid that is conspicuously lacking in the global and intergenerational case,” but comments that “this disanalogy is not too important, since I doubt that duties of global and intergenerational justice require this kind of consent” (312).⁹

We are thus suddenly rescued from the theoretical storm and transposed onto a placid moral shore, where duties of global and intergenerational justice not only exist, but hang over our heads

⁹ Gardiner adds: “Moreover, it seems likely that John makes the promise in large part because of his own understanding of his intergenerational responsibilities to his father and relatives as the new head of the family.” This seems conjectural. What we know is that John’s father has made him promise, and the promise would obligate John whether or not he had an understanding of his intergenerational responsibilities. Moreover, even if he did, inter- and intra-generational duties to close members of one’s own family are quite different from “duties of global and intergenerational justice,” customarily understood to extend to humanity at large and into the further future.

with more moral weight than promises themselves. This has implications for Gardiner's characterization of moral corruption:

In a situation where the moral requirements are otherwise clear, the discerning will be reluctant to go against them without some (at least vaguely) plausible rationale for doing so. Here rival (but specious) moral claims can be very attractive. They allow one to neglect unpleasant moral demands while still apparently seizing the moral high ground; indeed, they may even license the denouncing of the correct demands as actually immoral (308).

If one assumes that “moral requirements are otherwise clear,” those going against them will be acting akratically—against better judgment (i.e. judgment of what is best). Moral corruption will then be similar to what “opinion” was for Aristotle: “specious moral claims,” or opinion as opposed to true reason, will cloud our understanding, our ways of thinking and talking about climate change, the “discourse,” the “debate”—causing *judgment shifts* (we may end up denouncing “correct demands as actually immoral”).¹⁰ If, on the other hand, one does not assume the clarity of moral requirements, then there is no better judgment to appeal to, and moral corruption is changed into a corruption not of the understanding but of character—something like weakness of will.¹¹

¹⁰ Gardiner's Kant sees moral corruption much in this Aristotelian way, too—with the further, typically Kantian specification that the workings of “opinion” are all propelled by, and geared towards better suiting, “our wishes and inclinations.”

¹¹ Like any taxonomical schematization, the distinction between akrasia and weakness of will can be contested. Indeed, many writers do not draw it at all. However, the coincidence of these two phenomena is neither logically nor practically necessary (see Holton, *Willing, Wanting, Waiting*, 83-96). For example, I might *judge* that, given climate change, having children is not the best individual course of action to take; and yet *intend* not only to have children but also to make their lives as comfortable as possible, ensuring their

This takes us back to where we started. For as important as thinking and talking correctly about climate change can be, the main point is not to preserve the debate, but to intervene on and upgrade the motivational patterns that—as Gardiner told us—*generate* the problem. So why focus primarily on an analysis of the former task, and not the latter? And what are the promises of doing so? If the moral requirements are *not* “otherwise clear,” then there is no better judgment to appeal to when trying to clear up the terms of the debate. Of course, this does not mean that no clearing up is possible or useful, but it does mean that it will have to be done without reference to postulated moral requirements. If, on the other hand, there is a better judgment, then the mechanisms of moral corruption, as described by Gardiner, will work precisely by shifting it. And if moral corruption really entails Dashwood-style judgment shifts, then surely we should not expect the impetus to resist moral corruption to come from the judgment that resistance is best.

Gardiner himself says something similar:

[...] even if the best theories were to hand, it is not obvious that we could rely on ourselves simply to grasp and then correctly apply them. The apparent temptations not to do so and the subtle mechanisms of moral corruption are formidable obstacles. In ignoring them, the “invoke and apply” model fails to take seriously the problem at hand (309).

I think this is just right. But then, how are we to resist? Moral corruption is characterized *as if* the best theories were to hand, by assuming obligations we are not at all sure to have—unlike John Dashwood, who did contract an obligation by promising. These (assumed) obligations should arguably encapsulate some

enjoyment of high levels of consumption. In fulfilling that intention, I am acting akratically, and yet I do not seem to be displaying weakness of will: after all, that is the intention I have, and I am fulfilling it (perhaps with great effort, even, and perseverance, and self-sacrifice).

judgment as to what is morally best. We are then lead through a long (and brilliantly presented) journey into the meanders of our corrupted understanding of that judgment; but all the while we know—because Gardiner told us—that the real problem is motivational: and again, we have no reason to believe that the motivational problem will be solved through a better effort of the understanding.

In all this, an exhortation to virtue is buzzing in the background—though Gardiner confuses us with talks of duty. But we now wonder whether the virtue in question is really some kind of *epistemic* virtue—though one that is morally “powered,” because structured in reference to some postulated judgment as to what is morally best. If Gardiner is right that the Perfect Moral Storm is generated by spatiotemporally limited motivational patterns, however, that is not the sort of virtue we need. To defuse the perfect moral storm, we need to engage motivations—not (just) ways of thinking—“with a longer time-horizon and wider purview.” We thus need an account of what *practices*—what “forms of life”—would be most conducive to the development and exercise of relevant motivations (growing food locally through urban gardening, for instance, rather than shopping for imports at some mall). There is no apparent moral obligation to engage in such practices that our better judgment can reveal; but there is the *ethical possibility* of doing so, which a resolve can actualize. One’s motivational set is obviously not an immutable deliverance of evolution: it also emerges—along with character more generally—from the totality of one’s lived experience, and particularly from the behavioral regularities that are enabled and required by the practices one resolves to. Perhaps, then, individuals should just *choose* to develop and exercise “motivations with a longer time-horizon and wider purview,” by resolving to certain practices and not others. Choice is the capacity to form intentions even in the absence of a firm judgment as to what is

best. Weakness of will is the failure to maintain one's intentions in the face of temptation, where the latter entails judgment shifts. Resolves are intentions specifically designed to stand firm in the face of judgment shifts. Strength of will is the capacity to follow through on one's resolves. To follow through on one's resolve to a practice (or set of practices) is to define one's life—to *live* (and not just *think*) one way and not another.

To defuse the perfect moral storm, individuals must then resolve in favor of anti-climate change practices, and hold strong.¹² This is the sort of virtue we need: *ethical* virtue. When the fundamental problem lies in our motivational shortcomings, avoiding rationalization and remaining clearheaded about “the terms of the debate” can only constitute a relatively modest accomplishment. Confronted with the Perfect Moral Storm, we may not be able to afford the modesty.

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¹² Again, individuals might make that resolve for whatever reasons, including prudential ones if the practice generates benefits and not just costs (as does food-producing urban gardening). It is a task for governments to tease and court such reasons. Note that a government that does that need not necessarily be giving up on its spatiotemporally limited (and yet morally legitimate) motivational pattern in favor of more expansive ones.

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SYMPOSIUM
A CHANGING MORAL CLIMATE



A PRÉCIS TO
A PERFECT MORAL STORM
THE ETHICAL TRAGEDY OF CLIMATE CHANGE

BY STEPHEN GARDINER

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Reflecting on *A Perfect Moral Storm*

Stephen Gardiner

I am honored and grateful to the journal for proposing this symposium, and to my distinguished commentators for taking the time to engage with what is, apart from anything else, a very long book. Each of their papers deserves a fuller response than would be appropriate here; hence, inevitably, the few remarks I can offer will be too selective and too brief to address all the issues raised. Therefore, rather than attempting comprehensive replies, I will instead try to highlight those questions that seem to me the most central and interesting, especially when it comes to understanding the book itself. Luckily, my sense of the critiques is that behind the various disagreements are many, and often much more important, agreements, including about the importance of the ethical dimensions of the climate challenge. I am heartened by this general convergence, and the prospects it suggests for ethical action on climate change and other perfect storms in the future.

I

Game Theory

Smead, Sandler and I agree about many important things about the potential role of game theory in ethical theorizing, including those likely to be controversial to others. Nevertheless, in their view key disagreements remain.¹

1. Pluralism

One issue is that Smead and Sandler endorse a pluralistic approach that “uses multiple games to illuminate different aspects and dynamics of a complicated social situation,” and regard my approach as too monistic. Specifically, they criticize the book for being focused on representing climate change as “one big game,” as if (as they put it) the relevant question were “Which game theoretic is the right one for climate change?” rather than “Which games can usefully characterize which aspects of the climate problem?.” Unfortunately, I am struggling to see the force of this objection, and so worry that I may be missing something. In the spirit of engagement, I will now try to explain my reaction by sketching a few points. I suspect that Smead and Sandler would agree with most of them; however, if they do, I need more help in understanding their methodological worry.

In my view, my approach is appropriately pluralistic, and a more radical pluralism would be unattractive. On the one hand, the perfect moral storm analysis is self-consciously pluralistic in a couple of important ways. First, it is *internally pluralistic*: it suggests that climate change involves the convergence of a number of distinct challenges to ethical action. Several of these have game

¹ Rory Smead and Ronald Sandler, “Game Theory and the Ethics of Global Climate Change” (2014), this issue. (Hereafter ‘SS’)

theoretic aspects in themselves (the global storm, the intergenerational storm, the ecological storm, even perhaps the problem of moral corruption); several also have subsidiary aspects that also seem amenable to game theoretic discussion (e.g., the governmental global storm (127)²); some even invite the specific game Smead and Sandler accuse me of “entirely dismissing,” namely the battle of the sexes (e.g., the negotiation of shadow solutions (e.g., 122, 126, 137)). Second, the perfect moral storm analysis is also *externally pluralistic*: the analysis makes no claim to completeness (23). There are other dimensions of the problem, including other ethical dimensions, and some of these surely have aspects to which game theoretic analysis might be relevant.

On the other hand, I also believe that there are limits to the appeal of pluralism: it is neither possible nor desirable to be maximally pluralistic. For instance, the closest Smead and Sandler come to explaining what they mean by pluralism is in their complaint that “games such as the battle of the sexes should not be viewed as an alternative to the prisoner’s dilemma (and related games), but rather as a way of representing different aspects of the problem.” However, this claim strikes me as ambiguous, and so may mislead.

In general, game theoretic diagnosis of real world problems is not an inclusive project. There is no reason to ensure that all games are represented, and no background methodological assumption that this should be done. Indeed, too much pluralism would undermine the whole diagnostic enterprise. For instance, a maximally inclusive pluralism that demanded that all distinct games be assigned to at least one different aspect of the climate

² Stephen M. Gardiner, *A Perfect Moral Storm. The Ethical Tragedy of Climate Change* (New York: Oxford University Press, 2011). Unless otherwise specified, parenthetical references are to this text.

problem—so that none are left out—seems untenable. For one thing, there is no reason to presuppose such a happy alignment between aspects of the real world and theoretical possibilities. For another, there are just too many distinct games to accommodate: for example, there are at least 144 distinct two-by-two games alone.³

More specifically, radical pluralism would not fit with how the application of game theoretic models to real world problems actually works. First, while I agree that different games may characterize different aspects of the climate problem, games are genuine alternatives when it comes to characterizing the same aspect of a problem. For example, a specific structure cannot be both a battle of the sexes and a prisoner's dilemma at the same time and in the same respect, since the two models formally exclude one another. Given this, when talking about a specific aspect of a problem, one must choose and justify this choice.⁴

Second, the same game may be relevant to describing multiple aspects of the same problem. So, for instance, we might see the prisoner's dilemma employed to describe local, national and international aspects of climate change. Given this, the different models remain genuine alternatives to one another even if one recognizes that a given problem has many aspects. Notably, even if one chooses a particular game to describe one aspect, one cannot infer that other games will therefore be relevant to describing the remaining aspects.

Third, there is no reason to rule out “one big game” approaches in advance. In my view, when using game theoretic

³ Stephen DeCanio and Anders Fremstad, “Game Theory and Climate Diplomacy,” *Ecological Economics* 85 (2013), 177-187. (Hereafter, ‘DF.’)

⁴ Of course, there is still a significant philosophical question about what counts as a distinct aspect and how to identify one, but this is not the issue Smead and Sandler identify.

analysis, the main diagnostic task is to identify which models provide the best accounts of those aspects of the problem at hand that are most relevant to policy. “One big game” approaches are ambitious, but they may also have compelling explanatory value in so far as they successfully “simplify strategic interactions so that their underlying principles can be understood” (SS, 16), and so accord with the core aims of game theory. Admittedly, this initially appears unlikely for a situation as complex as climate change; nevertheless, such approaches cannot simply be ruled out in advance. In particular, even though (given the above) I reject the “one big game” approach for climate change when that is understood in starkly monistic terms, the same is not true of many of those who employ game theory, and especially those who view climate change as a traditional prisoner’s dilemma or tragedy of the commons. The view that climate change “is” a prisoner’s dilemma, for example, seems very common in international relations and economics, and it is my main target in the sections Smead and Sandler identify. Indeed, even the overview article Smead and Sandler cite in support of their pluralism says various things that fit the “big game” approach. For example, it asks ‘Is global climate protection more like a Prisoner’s Dilemma or a Coordination Game?’, states that ‘it is critically important to know whether countries face a situation that better resembles an N-player Prisoner’s Dilemma or an N-player Coordination Game’, and hazards its own answer that “a payoff structure that is entirely consistent with the current state of scientific knowledge is that of the Coordination Game” (DF, 182-185). To my mind, these are, at least initially, all sensible questions to ask, and rejecting them requires argument and argument. Any radical pluralist methodology that rules them out of court from the beginning should thus be rejected.

More generally, though the “one big game” approach may be too bold, we should not reject the idea that some aspects of the

climate problem are more important than others, and that choosing between distinct game theoretic models can help us to understand how and why this is so. Indeed, such claims seem essential if game theoretic analysis is to play a significant analytical role in policy. In the book, I argue that the intergenerational storm, and especially the tyranny of the contemporary, are especially important to appreciating the ethical challenge, and I support this with an analysis of the history of international climate policy. This, I suspect, is where the action is, and an overly radical commitment to pluralism would get in the way.

2. *Stag Hunt*

A second area of disagreement identified by Smead and Sandler concerns their enthusiasm for a game that I consider but do not highlight: the stag hunt. In the standard example, individual hunters must decide independently whether to hunt stag or hare. Hare they can get alone; stag hunting requires cooperation. Getting hare is okay, but the rewards are greater hunting stag. There are two stable equilibria (“all hunt stag,” or “all hunt hare”); however, all would prefer stag.

Smead and Sandler say the stag hunt is important for analyzing the climate problem because it “represents a crucial obstacle to social cooperation” where “there are stable preferable states, but they are hard to reach, since we are ‘stuck’ in a suboptimal but equally rational solution (*from the view of individual self-interest*)” (SS, 21, emphasis added). They go on to assert that the stag hunt is valuable for “characterizing the problem of generating responsiveness to climate change” (SS, 21). They contrast this with the prisoner’s dilemma model which, they say, represents the problem of stability. Specifically, on their view solutions to the prisoner’s dilemma tell us how cooperation can persist once it is

reached, whereas solutions to the stag hunt tell us how to get to cooperation in the first place.⁵

Smead and Sandler claim that I “dismiss” the stag hunt because “it does not capture the climate problem” as well as the prisoner’s dilemma, and remark that this is “an important oversight” (SS, 21). Though I cannot adequately address this issue here, let me make four quick comments.

The first is that my attitude to the stag hunt is more complex than the claim of “dismissal” suggests, and I worry that key features of my view are being lost in translation. First, in the relevant section I am considering the global storm aspect of climate change, not the whole problem. Second, I am comparing the stag hunt with my evolving tragedy of the commons (which the chapter is at pains to distinguish from the prisoner’s dilemma). Third, I go on to say that the relevance of both models is likely to be undercut by the intergenerational storm. Fourth, I explicitly suggest that the stag hunt might become relevant if that storm could be assumed away. If so, it could capture “the climate problem” on a larger scale. Fifth, however, I also say that this might be true of other models too, and that it is difficult to say in advance.

The second comment is that I remain unsure why Smead and Sandler think that identifying the stag hunt is likely to play a large role in “*generating responsiveness* to global climate change.” Specifically, I can see that it would be important if the current situation were one in which countries’ current (very weak and sometimes obstructionist) actions on climate were best

⁵ As it happens, I would resist this account. For example, in my view solutions to the prisoner’s dilemma often facilitate cooperation. However, I will not pursue such arguments here.

understood as “hunting hare” and their aspirations as “hunting stag.” However, what reason do we have to think this?

The third comment concerns one possible answer. Smead and Sandler sometimes seem to be asserting that countries really believe (a) that, “*from the view of individual self-interest*” (SS, 21), strong universal climate policy is the “stable preferable state” that is hard to reach (“hunting stag”), and (b) that they are “currently “stuck” in a suboptimal but equally rational solution” (“hunting hare”). However, these assertions appear to neglect much of the perfect moral storm analysis, including its explanation of the history of climate policy. As such, they require some clarification and defense. Not only is some account of what “individual [in this case presumably “national”] self-interest” means clearly needed⁶, but Smead and Sandler need to show how their view overcomes pressure from both sides.

Specifically, on the one hand, if nation states conceive of their interests in ways that are biased towards the current generation (as the perfect storm analysis suggests), then their history of weak action may be “hunting stag” from their point of view, as this may constitute the most desirable shadow solution. If so, “solutions” to the stag hunt considered as such will not help to promote more robust climate action.

However, on the other hand, if the self-interest assumption is simply the old saw that countries can be relied upon adequately to represent the interests of current and future generations—so that one can assume away the intergenerational storm—then, while the idea that serious cooperation on climate is a stable and much preferred outcome (“hunting stag”) becomes more plausible⁷, it

⁶ See also, Stephen Gardiner and David Weisbach, *Debating Climate Ethics* (Oxford University Press, forthcoming).

⁷ This is why I say in the book that there *may* be a role for the stag hunt in analyzing this situation. Moreover, this is somewhat attractive on my view

nevertheless remains a mistake *simply to assume* that the stag hunt is the appropriate model for this aspect of the climate problem. One reason is that, if we are assuming that the intergenerational storm has been dealt with, it is hard to say in advance that the current situation amounts to a stable, “suboptimal but equally rational” solution (“hunting hare”) rather than something more seriously dysfunctional.

To illustrate this point, consider just two issues. First, given that the current emissions trajectory poses significant risks of severe harms and catastrophe, it is not clear why appropriately *intergenerationally* sensitive governments would regard it as equivalent to “hunting hare.” On the contrary, they may be so strongly motivated to avoid serious climate change that no solutions seem to them either rational or stable that do not involve very robust climate action. In this case, the correct game theoretic diagnosis may be a game like harmony, rather than stag hunt (cf. DF, 179).

Second, more generally, successfully addressing the intergenerational storm may *radically transform* the global situation. For instance, it may require major institutional reform; and, depending on how this accomplished, this may make many different accounts of the remaining intragenerational problem plausible (125-6). Given this, the rush to endorse a stag hunt analysis seems premature. An analysis of the game theoretic shape of the problem faced by a set of appropriately intergenerationally sensitive institutions will depend to a considerable extent on the structure of those institutions, and their relations to the rest of the global institutional architecture. Since these are currently

since my own interpretation of the perfect storm suggests that its deepest root is institutional.

obscure to us, we should not prejudge which model would make most sense of it.⁸

3. Intergenerational Games

Such worries suggest that the differences between myself and Smead and Sandler may be more serious than first meets the eye. In particular, I wonder whether they may be much more sympathetic to the traditional game theoretic analyses of climate change than I am. I am far from sure that this is so; however, there appears to be some indirect evidence for it in the commentary.

To begin with, it is possible that Smead and Sandler are unmoved by the intergenerational aspect of my analysis. Notably, they never mention either the intergenerational storm in general, or the tyranny of the contemporary and pure intergenerational problem in particular; moreover, what they do say tends to push these ideas aside. First, they continue to list the prisoner's dilemma as "the hard case" for solving a cooperation problem (SS, 19), even though I argue that the pure intergenerational problem is worse. Second, they highlight the stag hunt in part because of its connection to solutions to the prisoner's dilemma (SS, 19). Third, they list mitigating carbon emissions as an important aspect of climate change that *mirrors a prisoner's dilemma*⁹

⁸ See also, Stephen Gardiner, "Calling for a Global Constitutional Convention Focused on Future Generations," forthcoming in *Ethics and International Affairs*.

⁹ Some writers describe something like the tyranny of the contemporary as "an intergenerational prisoner's dilemma." This strikes me as a mistake. Though there are interesting commonalities (as I point out), there are also significant structural differences with serious policy implications. In my view, describing the pure intergenerational problem (for example) as an "intergenerational prisoner's dilemma" makes about as much sense as describing the battle of the sexes or harmony games as "friendly prisoner's dilemmas."

(SS, 19) even though I argue for a perfect moral storm model dominated by the tyranny of the contemporary, and also specifically claim that the prisoner's dilemma analysis of the global storm is undercut by the intergenerational storm.

More intriguingly, to illustrate their pluralist view Smead and Sandler reference with approval a recent overview of the potential contributions of game theory to climate policy. However, this (otherwise very helpful) paper manifests several features of the traditional approach in international relations and economic theory that I am arguing against.

First, it continues with the traditional assumptions. Most notably, despite framing itself as an “*exhaustive* treatment of the climate relevant 2*2 order games” (DF, 185; emphasis added), the paper simply *fails to consider* the intergenerational dimension, including the possibility of a tyranny of the contemporary, or indeed any aspect of the intergenerational storm. For instance, a basic assumption of the analysis is that there is “no economic or geopolitical advantage to be gained” if countries both pollute instead of both abating (DF, 178; cf. 181). This assumption appears to rule out the possibility of intergenerational buck-passing right from the start.¹⁰

Second, the paper promotes traditional solutions. For one thing, its main policy-relevant conclusions are that “the overriding barrier to achieving an international agreement to

¹⁰ The authors make a couple of remarks very late in the paper that indirectly signal some disquiet about this assumption (DF, 186). However, given their claims to be offering an exhaustive analysis of the climate-relevant games, they apparently do not see a role for game theoretical analysis in exploring such matters. Intriguingly, they also suggest that one source of “unhappy” games in which it is difficult to get an agreement to abate is where the players “live in different moral universes” (DF, 183), though they do not suggest different views in intergenerational ethics as a source of such differences.

protect the climate may be *a failure of the leading governments to grasp the seriousness of the climate risk*” (182; emphasis in original), and that “greater understanding of the science” is key to resolving this problem (186). For another, the science it regards as important is the claim that “climate change is an existential threat to humanity and civilization, at a non-zero probability of significant magnitude that cannot be ignored” (182; emphasis added), and this is because they assume that this threat can engage with national “self-interest” understood as a concern for survival (182).¹¹

In my view, this approach continues the mainstream tendency to focus almost exclusively on scientific issues and on international politics, while neglecting the ethical dimensions of the climate problem. It is thus very much opposed to my message in the book. Moreover, this narrowness causes mainstream approaches to neglect important features of the geopolitical situation that would be highlighted by a broader game theoretic approach. For example, in addition to missing the tyranny of the contemporary, the paper also overlooks two more specific policy implications of the perfect moral storm analysis. One is the argument (in chapter 6) that, rather than driving solutions, the prospect of increasingly severe climate change may make matters much worse by setting off the equivalent of an intergenerational arms race. The other is the possibility, central to my own interpretation of the perfect moral storm, that a vital element of the climate problem is an institutional gap, and that institutional reform may be needed to fill it. Both threats suggest that much more than “greater understanding of the science” is needed. Again, the problem of misdiagnosis looms large.

¹¹ They do add “(perhaps reinforced with equity considerations)”; however, there is no indication that intergenerational considerations are what they have in mind and the context suggests otherwise.

II

Responsibility

Dale Jamieson and I agree on many things in climate ethics, and on the most important. Even when it comes to the main issue at stake between us here—responsibility—our views are relatively close. Both of us believe that humanity faces a profound ethical challenge, and that part of the problem is that current practices fail to grasp this. Both of us think that moral corruption is part of the problem, and virtue part of the solution. Both of us suppose that a solution will probably require “the formulation and implementation of new moral norms and concepts.”¹²

Where we differ is in our sense of the roots and scale of the ethical challenge. Jamieson believes that the roots are deep, and seems pessimistic about solutions. He believes that our current values evolved in “low-population-density and low-technology societies, with seemingly unlimited access to land and other resources,” and so are ill-suited to a globalized world.¹³ For him, the heart of the problem is that these values contain an account of responsibility which “presupposes that harms and their causes are individual, that they can be readily identified, and that they are local in time and space.” Since climate change fits none of these criteria, our current values are inadequate. More specifically, Jamieson claims that our normal concepts of ethical responsibility fail to “gain traction” when confronted with issues such as climate change because these do not have the features of a

¹² Jamieson says that the difference between us is that while I believe that we have moral norms and concepts that apply that we are not living up to, he thinks that we do not have adequate moral norms and concepts that motivate us. However, since I think there is a theoretical storm, my view is perhaps more complex than this contrast implies. See Section VI.

¹³ Dale Jamieson, “Ethics, Public Policy and Global Warming,” *Science, Technology, and Human Values* 17 (1992), 139-153, at 148.

paradigm moral problem as represented in his Jack and Jill example, and this undermines how we understand the urgency of the case. Thus, he concludes, we face a “new problem”: “the possibility that the global environment may be destroyed, yet no one will be responsible.”¹⁴

I agree with Jamieson that conventional practices—at both the individual and social level—“fail to grasp, or get a grip” on climate responsibility, so that it “slips through the cracks.” Let us call this “the grasping problem.” One possible cause of this problem is Jamieson’s diagnosis that our ethical *concepts* fail to “gain traction.” However, this is not the only candidate explanation. I want to allow for rival explanations, including (though not limited to) the ones I suggested in the original paper. Though I cannot address all of the issues in this short reply, let me highlight a couple of points.¹⁵

1. Metaethics

One possibility involves metaethics. Jamieson is an avowed internalist about moral motivation. He thinks that if one really appreciates a justifying reason, then one will automatically have a corresponding motivating reason to act accordingly. As a result, for him a lack of motivation implies some kind of cognitive failure, and in this case he thinks the cause is conceptual. By contrast, I am willing to take externalism seriously. Externalism holds that agents might grasp the moral severity of a particular action perfectly well—and so possess a justifying reason not to do

¹⁴ Jamieson, “Ethics, Public Policy,” 149.

¹⁵ I pursue some of this in more depth in Stephen M. Gardiner, “Is No One Responsible for Global Environmental Tragedy? Climate Change as a Challenge to Our Ethical Concepts” in Denis Arnold, ed., *Ethics and Global Climate Change* (Cambridge: Cambridge University Press, 2011), 38-59.

it—and yet not be motivated accordingly. In the most obvious cases, they see what the right thing to do is, but just don't want to do it.¹⁶

Externalism is one way to avoid Jamieson's conclusion about the need for a conceptual paradigm shift. Under internalism, a lack of motivating reasons suggests a lack of appropriate justification. However, according to externalism, we might genuinely appreciate the moral severity of the problem, and so the justifying reasons, and yet still not be motivated to act. This might show that there is something wrong with us (our motivations), but not with morality (our moral concepts). Perhaps we are just bad or imperfect moral agents. This need not imply that we need a conceptual paradigm shift, only that we ought to be morally better than we (currently) are.

2. *Delegated Authority*

Of course, rival candidate explanations for the grasping problem are available even without recourse to metaethics. Jamieson suggests in his current paper that “the most fundamental distinction in our prevailing moral consciousness is between [acts] that are morally suspect and those that are not,” either because they are in a protected private sphere, or just because as a default we regard “most of what people do” as morally permissible (J, 39). He then argues that most acts relevant

¹⁶ Jamieson likely does not distinguish between them because he assumes that there is a tight connection between appreciating moral severity (justifying reasons) and being motivated to act in accordance with them (motivating reasons), so that to some extent they stand or fall together. In particular, according to a popular and mainstream view in contemporary metaethics (“internalism about moral motivation,” or simply “internalism”), if one really appreciates a justifying reason, then one will automatically have a corresponding motivating reason to act accordingly.

to climate change are not in the domain of “the suspect”; this is because they deviate too far from his paradigm case of Jack and Jill, and are “just a consequence” of people “getting on with their lives” (J, 42).

My account offers an alternative explanation of these phenomena. According to a long tradition in political theory, political institutions and their leaders are said to be legitimate because, and to the extent that, citizens delegate their own responsibilities and powers to them. The basic idea is that political authorities act in the name of the citizens in order to solve problems that either cannot be addressed, or else would be poorly handled, at the individual level, and that this is what, most fundamentally, justifies both their existence and their specific form.

Some democratic thinkers believe that the role of social and political institutions is to discharge as many ethical responsibilities as possible for the citizenry, so that under an ideal system individuals would not have to worry at all about such responsibilities, but would instead be maximally free to engage in their own pursuits (subject to the external constraints set out by the system). However, here it is noticeable that success breeds the elimination of responsibility at the individual level. The better the rest of the system is at discharging responsibilities on behalf of individuals, the fewer direct demands such responsibilities make on the individual. Hence, it is likely that the demands themselves become unfamiliar, and indeed perhaps invisible to the individual herself. If this is right, it seems plausible to think that the more effective a social system is (or is perceived to be) in discharging responsibilities in general, the more demanding any significant unmet responsibilities will seem. Or, to put the point in another way, for those used to very wide freedom to pursue their own ends without worrying about wider responsibilities, the

emergence of a serious failure to discharge is likely to be deeply jarring. The issues will seem very unfamiliar and the nature of the responsibilities extreme. Still, this may say more about the past successes of the delegated responsibility paradigm than its defects.

None of this suggests that the delegated responsibility paradigm is not open to criticism. Instead, my point here is that this is not a “new problem”: the whole idea that individuals are responsible in this way is philosophically bold and puzzling. Climate change is one example; but there are countless others. So, there is a real question about why we should take this worry as special to global environmental problems, or especially problematic there. There is also a real worry that in a perfect moral storm we, the current generation of the affluent, might be complicit in moral corruption when we do.

3. Personal vs. Political

One implication of this rival explanation of the grasping problem is that Jamieson and I may also disagree about the relative importance of personal and political responsibility at the individual level. The delegated responsibility model helps to cast this debate in a different light. Consider a more standard case than climate. Suppose that there is a breakdown in basic security in another city in one’s own state or country. For example, suppose that the entire police force of upstate New York were to resign, with the result that law and order vanished from the streets of Albany. Who would have the responsibility to deal with it? Presumably, it is the city and state governments, and (failing that) the government of the United States. Why? On the delegated responsibility model, it is because they have delegated authority to act “in our name.” However, what if all of these

efforts to delegate failed? Would the rest of us be off the hook?¹⁷ On the delegated responsibility model, the obvious answer is ‘no’. Primarily, each of us would have some responsibility to try to get the existing institutions to live up to the responsibilities delegated to them, and (if this turned out to be hopeless) to establish new ones to replace them. Secondly, we would also have a responsibility not to thwart good efforts to achieve these goals, but to cooperate with them. For instance, we should not try to benefit from the lawlessness by sending in looting parties, or making black market deals with potential looters.

Would each of us also have an individual responsibility to “get armed and go North” in order to police the streets of Albany ourselves? In principle, perhaps, if all other efforts towards better solutions failed. In practice, I doubt that it would come to that. Uncoordinated individual action would be a pretty poor way of addressing the real problem, and come at a very high cost. If we got to the point where average individuals had to seriously consider packing rifles and flak jackets, an awful lot would have to have gone wrong. Moreover, there would also have to be a good chance of making a meaningful difference, and the prospects for better solutions would have to be bleak. Consequently, on a plausible interpretation of the delegated responsibility model, the problem is not that there is a conceptual problem with individual responsibility, but that focusing on the individual’s personal behavior seems the wrong way to tackle the problem, or at least so far down the list of serious options that it is a poor focus for action. Though there is some point to modifying one’s personal behavior (e.g., by trying not to make the overall situation worse), individual political responsibility seems much more central.

¹⁷ The wider burden may initially fall on Americans. However, under a number of circumstances the ‘us’ would extend to a wider global public.

4. *George and Jack*

Jamieson and I also disagree about paradigms and their role. Jamieson wants to “understand why we generally do not see our individual actions that contribute to climate change as morally valenced” (J, 44). He explains the grasping problem in terms of a conceptual failure, and argues for it using his classic example of Jack and Jill. He thinks that “through the lens of commonsense to see these acts as analogous to Case 6” (J, 44), but Case 6 has no traction for us. Rather than as a matter of responsibility, we tend to see the loss of bicycles that results as “just a consequence of Jack and others getting on with their lives,” and so in the “morality-free zone” mentioned earlier (J, 42).

Jamieson says that the difference between the two of us amounts to an empirical dispute as to whether Jack 6 or George 7 is “closer to how most people see some actions that contribute to climate change.” Though he concedes that in the end empirical research would be needed to answer this question, he thinks it obvious that most people don’t think of their climate-relevant behavior as akin to throwing fireworks over poor parts of town, as George 7 proposes. I have three initial responses.

First, in general, I agree that it is an open question whether most people see climate change in general, or individual climate actions in particular, as raising ethical questions. However, I wouldn’t bet against it. In my experience, plenty do. Moreover, most people who reject the ethical framing do so either because they don’t think climate change is a problem (they are deniers), or because they think ethics is somehow unhelpful from the point of view of driving solutions (usually because they believe that other people are self-interested and not moved by ethical concern, however conceptually appropriate).

Second, I also agree that it is an empirical question how people actually understand the ethical shape of climate-relevant action. Still, for whatever it is worth, Jamieson and I have clashing intuitions here. For reasons mentioned in my original paper, I would be amazed to discover that people think of their climate-relevant behavior as conceptually akin to “depriving future people in other countries of bicycles.” Moreover, in my personal experience, the fireworks story is much more likely to fit what they actually say and are concerned about, and especially their picture of the important harms of climate change.

Third, in any case, whatever the answers to these questions, in my view the central issue for Jamieson’s account is whether people are prevented from understanding climate change as an ethical challenge *because of* a deep conceptual problem concerning the nature of moral and political responsibility, as illustrated in the Jack and Jill example. This is also an empirical question, but of a deeper kind. Still, it is surely relevant to that question to ask whether there is such a conceptual problem. If, as I argue, there is not, because Jack 6 involves a misdiagnosis, then how people actually “see” things (the shallower empirical question) may not settle the issue. Instead, we need to know why they do so; after all, even if they are inclined towards bicycles, this may itself be a sign of moral corruption.

III

Geoengineering

Geoengineering raises many questions. Two that are likely to jump out to moral and political philosophers are:

- (1) Are there any circumstances under which geoengineering could be morally and politically justified?
- (2) If there are such circumstances, might they actually arise in the climate case?

Chapter 10 of *A Perfect Moral Storm* is concerned with neither of these questions. However, to avoid distractions, let me just say that my view is that the answer to both is “yes.” There are explicit indications of this in Chapter 10. Specifically, I say in passing that my criticisms of the Arm the Future argument themselves suggest where we might look for more successful arguments for geoengineering (378, 396), and specifically identify a realm of “fully moralized” arguments that incorporate concern for (at least) liability, compensation, political legitimacy, and lingering inertia (378).¹⁸

Despite this, the two justificatory questions are neither the main subject of chapter 10, nor important to its purpose. Instead, the chapter is concerned with developing a specific implication of the perfect moral storm analysis, the threat of an “evolving shadow strategy.” Its goal is to explore this threat by illuminating “the possibility of moral corruption when geoengineering is pursued,” and explaining “the ethical implications of this” (340). In particular, my concern about the fully moralized arguments is not their existence, but their relevance: “we must take seriously the possibility that robustly moralized [geoengineering] solutions will be even less politically available than [conventional] options” (396).

¹⁸ Elsewhere, I add governance mechanisms, and individual protections. See Stephen M. Gardiner, “Geoengineering and Moral Schizophrenia: What’s the Question?” in William Burns and Andrew Strauss (eds.) *Climate Change Geoengineering: Legal, Political and Philosophical Perspectives* (Cambridge: Cambridge University Press, 2013), at 14.

These preliminaries are helpful in clarifying what is at stake in Christopher Preston's commentary. Preston and I do not disagree about whether it is *possible* to justify geoengineering. We also agree that there is a threat of moral corruption, and that it deserves to be noted. Still, Preston has reservations.

First, he believes that, though moral corruption is possible, it is not (yet) manifest in practice, in early policy discussions. Most notably, he claims that leading scientific authorities take stronger positions on geoengineering policy than my focus on "moderate research only" suggests, and given this "we should take the research scientists at their word and trust them that SRM alone is not their goal" (P, 29-30)¹⁹.

Second, Preston believes that emphasizing the threat of moral corruption has a "political cost": "well-meaning researchers become defensive when it is suggested that their intentions are simply to avoid doing anything about emissions" (P, 34). He thinks that this is regrettable "when they seem to view their work as a genuine effort to help in the face of a situation that seems increasingly to be getting out of hand" (P, 34). To avoid this undesirable "chilling effect" (my words, not his), Preston suggests that "while Gardiner's warning about moral corruption must be heeded, it should not drive the discussion" (P, 34).

1. The Subjects of Moral Corruption

One issue between us is the question of what the primary subjects of moral corruption are supposed to be. Preston assumes that it is particular scientists or scientific policy groups. However, my focus is not on such actors; in fact it is not really on agents at

¹⁹ Christopher Preston, "Moral Turbulence and Geoengineering: A Lingering Hazard from the Perfect Moral Storm," this issue. (Hereafter, 'P.')

all (see also 2013, 28). In the book, I am concerned with “corruption that targets our ways of *talking and thinking*, and so prevents us from even seeing the problem in the right way” (301); hence, my primary subject is the *public discourse around climate change* and the need to protect it against this threat. Hence, I say “our main interest in moral corruption is really with how to fight it, *not who to blame for it*,” given that “we are the ones vulnerable” to such distortion (308; emphasis added).

Moreover, insofar as (as a distant secondary matter) my analysis has implications for evaluating agents, my central concern would not be with those arguing for geoengineering, but with those to whom such arguments are directed, and especially those who will make the relevant decisions (typically, governments) or are ultimately responsible for them (typically, national publics).²⁰ I take it that the idea that most of the arguments for geoengineering I discuss are directed at such agents is uncontroversial. The proponents of geoengineering I am talking about are quite self-consciously trying to advise governments, to influence the policy discourse, and (often) to bring the discussion to the wider public. Hence, even when it comes to the secondary matter of agents, my main concern is with whether the *acceptance* of certain arguments by some of these bodies would involve succumbing to moral corruption.²¹ Importantly, by itself this

²⁰ For example, in the Austen case in the preceding chapter on moral corruption that sets up this one, I am much more concerned with John than with Fanny.

²¹ For instance, in more recent work, I discuss a specific kind of example where this appears to be the case. In situations of *creative myopia*, “an agent invokes a set of strong moral reasons to justify a given course of action, but this course of action is supported by those reasons only because the agent has ruled out a number of alternative courses of action more strongly supported by the same reasons, and where this is due to motives she has that are less important, and are condemned by those reasons” (Gardiner, “Moral Schizophrenia,” 19).

concern does not imply that those *offering* the arguments are themselves morally corrupt, as Preston appears to assume.²² More importantly still, nor would the concern necessarily be assuaged even if we were confident that the relevant scientists could be taken at the word about their own intentions. Most obviously, in a setting prone to moral corruption, perhaps their intentions make little difference.

2. The Paradox of Political Inertia

One worry I have is that turning the emphasis of the moral corruption discussion towards who is arguing for geoengineering risks obscuring a central point. In my view, some arguments for geoengineering are far too simplistic, especially in the way they take a highly moralized “geoengineering is necessary to save the planet” approach. These arguments fail to take seriously the fact that, even if some forms of geoengineering policy are or might be an important part of a moralized solution, others can also manifest the problem and even make it worse. One of my claims is that in context the most ethically defensible (i.e., fully-moralized) versions of geoengineering policy seem unlikely to be adopted. The main reason for this is that they are morally and politically demanding in similar ways to other robust climate policies that are already subject to political inertia.

This point is especially relevant to early arguments for geoengineering, since many of these are motivated by a concern for political inertia. The key problem is that, after taking that motivation very seriously, they then proceed to neglect it. For instance, in chapter 10 I focus on a popular argument I call the “Arm the Future” argument. One reason I dislike the generic

²² They may be; but they may not. At most, it raises the question—a question that in any case is not my focus.

version of this argument is that it assumes that geoengineering becomes a serious policy option only because of political inertia, but then fails to consider how such inertia might also constrain geoengineering options. We might call this *the Paradox of Political Inertia*.

3. *What People Say*

Arguably, the paradox of political inertia infects the early debate. Consider just a few issues. First, some appear to assume that only highly moralized geoengineering policies are on the table. This often seems to be Preston's approach. For example, in discussing an "SRM only" approach he uses the language of "necessity" to circumscribe the options:

[...] the political security necessary for a stable, long-term deployment would *have to be* established. [...] Mechanisms to compensate those harmed by precipitation changes associated with SRM would *have to be* created ... This list of requirements *necessary* for perpetual SRM is long and the costs are obviously high (P, 32).²³

Similarly, for limited term geoengineering, Preston says:

If the prospect of perpetual SRM is rejected then some serious planning for cessation—involving significant emissions reductions and perhaps even some carbon dioxide removal from ambient air—is *required* (P, 33).²⁴

²³ For example, though he says we need compensation, an exit strategy, etc. Preston does not even consider minimal versions of geoengineering policy, or the possibility of minimally decent or positively indecent geoengineering policies. I think this is myopic. I also think it has a potentially undue warming effect on the geoengineering discourse. If we encourage people to think that ethically robust mitigation and adaptation is on the table, coupled with ethically robust geoengineering, then we are promoting a misleading picture.

²⁴ I agree that cessation is underdiscussed. The problem of moral corruption may provide part of the explanation of why.

Unfortunately, such “requirements” presuppose decision-makers who are interested in long-term stability and compensation. These seem to be ethical concerns. Importantly, it is not obvious why a buck-passing generation would see them as necessary features of a geoengineering policy. Many possible geoengineering policies do not include them. This would suggest that they are flawed from the ethical point of view. However, that does little to reassure us that none of them would ultimately emerge. In my view, we should not discourage discussion of such possibilities by assuming them away. To do so underestimates the moral and political complexity of geoengineering policy.

The second issue is that it is far from clear that those who advocate for a more general approach to climate policy that includes geoengineering have a full appreciation of the ethical implications. One concern is that mitigation and adaptation are not all that is at stake here. For instance, ethical geoengineering would have to address difficult issues of global governance and compensation. However, these would involve deep questions about global legitimacy and international justice that are barely even on the agenda. For example, even when major reports mention governance, they tend to assign it to venues that seem inadequate to the profound issues raised. The Bipartisan Policy Center’s report, for instance, takes a very limited “coalition of the willing” approach to international cooperation, where a necessary condition for membership of the willing seems to be being well-resourced, scientifically and otherwise.²⁵ (This was a major reason

²⁵ Bipartisan Policy Center 2011, *Geoengineering: A National Strategic Plan for Research on the Potential Effectiveness, Feasibility, and Consequences of Climate Remediation Technologies*, 31.

<http://bipartisanpolicy.org/library/report/task-force-climate-remediationresearch>

that I withdrew from that report.)²⁶ Moreover, even the more ambitious Royal Society report suggests as the appropriate venue the United Nations Commission for Sustainable Development, rather than mentioning more robust venues such as the UN Security Council, NATO, the G20, the US Congress, let alone the possibility of radical geopolitical reform.²⁷ Neither approach seems to take very seriously the point that geoengineering is a genuinely global and intergenerational issue that potentially affects fundamental aspects of the lives of billions of people, many of them poor or residing in poor countries.

The third issue is that it is not clear how deep the commitment even to partially moralized geoengineering policies suggested by such reports really is. Some are, no doubt, deeply sincere. However, for others the situation is more complicated. For example, in recounting his own BPC experience in *Nature*, Dan Sarewitz tells us that he yielded on some points “in order to gain political capital to secure issues that had a higher priority for me,” and that others did the same.²⁸ In general, Sarewitz concludes “disagreements between panelists are settled not with the ‘right’ answer, but by achieving a political balance across many of the issues discussed.” Such a balance might not, therefore, show a serious commitment to moralized geoengineering. For instance, in context, some may believe that publicly backing more comprehensive climate policies turns out in practice to be functionally equivalent to promoting very limited approaches,

²⁶ Cf. Joe Romm, 'Dysfunctional, Lop-Sided Geoengineering Panel to Launch Green Washing Euphemism 'Climate Remediation'', *Climate Progress*, October 11, 2011.

²⁷ Gardiner, “Moral Schizophrenia”; Stephen M. Gardiner, “Some Early Ethics of Geoengineering: A Commentary on the Values of the Royal Society Report” *Environmental Values* 20 (2011), 171.

²⁸ Daniel Sarewitz, “The Voice of Science: Let’s Agree to Disagree,” *Nature* 478, 7 (2011).

such as modest geoengineering research only. Hence, though they feel politically obliged to make the familiar claims about the need for mitigation, adaptation and robust governance, they also see themselves as insulated from accepting the ethical implications by (what is in their assessment) the wider geopolitical reality. Though this may not apply to many scientists, it is one factor in the emerging politics of geoengineering. As one leading researcher recently advised me, “don’t assume that the arguments in print are the one’s scientists really believe.”

4. Chilling Effects

Preston’s second main worry is that highlighting the possibility of moral corruption has a “political cost.” In particular, he worries that “well-meaning researchers become defensive when it is suggested that their intentions are simply to avoid doing anything about emissions.”²⁹ I do not think that this should be a major concern. For one thing, I have already said that my focus is not on the *intentions* of researchers. For another, to the extent that

²⁹ I’m not sure which “political cost” Preston intends. The most obvious reading is that it is just a cost for ethicists who are denied opportunities to engage with scientists. However, a stronger claim would be that this aspect of the perfect storm analysis itself contributes to political inertia on climate change by reducing the likelihood that scientists will pursue geoengineering, especially of the fully moralized kind. I confess that I have not (yet) personally seen any evidence of a chilling effect of the first sort. The second “cost” is more interesting. Some may calculate the odds of moralized geoengineering to be small enough (and the risk of morally indecent geoengineering so high) for the cost to be worth absorbing. I am not sure what to think of this argument, except to say that this is a question scientists have to wrestle with (regardless of what I say), and that neither this answer nor its contrary seems obviously wrong. However, one thing that seems worth pointing out is that a refusal to engage for fear of being accused of participating in moral corruption is not itself proof against such corruption. In some settings, my argument (appropriately misinterpreted) may be a convenient scapegoat.

it matters, I think the raising the problem of moral corruption actually helps to articulate a concern that scientists already have, and which has a more important “chilling effect” on research. In my experience, many well-meaning scientists are concerned about participating in geoengineering research because they fear that they may thereby be drawn into an activity that makes things worse, rather than better. In particular, they are worried about science being used to exacerbate global problems, and especially environmental injustice, and do not want to *become complicit* in this. They are therefore (rightly) suspicious of the overly simplistic “save the planet” arguments common in early discussions of geoengineering, and in particular their strongly moralistic flavor. My analyses in chapter 10 and elsewhere help to articulate these worries by exploring some of the moral complexities of geoengineering. Though this may have some “chilling effect” on the simplistic arguments, this seems warranted. It also seems better than encouraging the “warming effect” of presupposing that the only kinds of geoengineering on the table are fully moralized versions, and therefore ignoring the problem of political inertia. In practice, this seems a very dangerous assumption indeed. From my point of view, it provides a strong reason why the issue of moral corruption—understood in terms of the distortion of our ways of thinking and talking—should remain close to the center of discussions of geoengineering policy. Unless well-meaning researchers can be reassured that their efforts are likely to help address, rather than exacerbate, the perfect moral storm then we are unlikely to see the right kind of progress. However, this is largely a problem about our (collective) intentions rather than theirs. Ignoring it threatens to have very high moral and political costs.

IV

The Intergenerational Storm

Gianfranco Pellegrino poses a number of potentially serious challenges to my analysis. Prominent among these are:

- (1) My account relies on a conception of intergenerational fairness that is not licensed by the intergenerational storm.
- (2) We lack compelling duties of fairness towards future generations.
- (3) At most, we have duties of beneficence towards future generations
- (4) We have strong duties of intragenerational justice towards present victims of climate change.
- (5) These claims (1-4) undermine the unity of the perfect moral storm analysis by suggesting that the problems of climate ethics are scattered.

Though I cannot respond to all of them here, I will offer a brief response to the most pressing.

Pellegrino's main argument takes the form of a specific analysis of the intergenerational storm, the two worlds story, made vivid through a specific analogy, Derek Parfit's auditorium problem. Within the two worlds story, the first, maximal world is one where each generation restrains its maximization, and the second world is the lowering-maximizing world "where the first generation overemits and later generations continue this trend."³⁰

³⁰ Gianfranco Pellegrino, "Justice in the Auditorium," this issue. (Hereafter 'GP'.)

Pellegrino claims that our world is of the second kind, where the first generation has already passed on, and we and our successors are in later generations. This implies, he says, that “the moral assessment of a lower-maximizing world is the *only relevant* issue in intergenerational ethics” (GP, 82; my emphasis). Moreover, this assessment should not involve concepts such as harm, fairness and justice. Pellegrino says: “only the first generation can be asked to be fair,” “later generations are not causally responsible [...] fate has been fixed,” so that “demanding each of the later generations to abstain cannot be a request of fairness, but rather a duty of beneficence” (GP, 86).

To illustrate these claims, Pellegrino employs an auditorium analogy. In a flat auditorium, if the first row stands up this blocks the view of each subsequent row equally and none are further disadvantaged when rows between them and the first also stand up. Hence, “the first row’s choice worsens the view of each of the other rows, while the choices of each of the other rows have no impact on the succeeding rows,” with the consequence that “each of the rows except the first does not harm their successors, at least not in the sense of making them worse off” (GP, 85).

My most general objection to Pellegrino is that his approach involves a serious misdiagnosis. Specifically, his assumptions about the shape of the intergenerational storm strike me as highly specific, very stark, and most importantly as not fitting the climate case.

1. *“Fixing Fate”*

Let us begin with Pellegrino’s claims that the first generation is in the past and has already done its work, that given this each subsequent generation is precommitted to an equal level of harm, and that the first generation’s successors cannot add to that harm.

This picture appears false for climate change. In particular, mainstream scientific analysis suggests that current and future generations can increase the level and speed of climate change. The IPCC, for example, offers various scenarios for future changes in global temperatures over the next hundred years and beyond, these scenarios are associated with different levels of negative impacts, and the difference between them depend in large part on the emitting activities of current and future people. For example, a low emissions pathway through the 21st century makes it likely that the overall temperature increase will be less than two degrees Celsius (relative to 1850-1990), whereas a high emissions pathway makes it unlikely.³¹

This has several implications. First, it is simply not true that the first generation “fixes the fate” of its successors, in the sense that “each of the rows except the first does not harm their successors, at least not in the sense of making them worse off.” Consequently, Pellegrino is mistaken to claim that “the choices of each of the other rows [after the first] have no impact on the succeeding rows” (GP, 85).

Second, in fact, the situation is in some ways the very reverse of what he suggests. Arguably, the most dangerous greenhouse gas emissions are still in the future, and without them earlier emissions would not be nearly so problematic, and perhaps (on some views) not problematic at all. This is reflected in the fact that mainstream scientific groups, such as the IPCC and the Royal Society continue to claim that it is possible to avoid

³¹ Intergovernmental Panel on Climate Change (IPCC), Working group 1, “Summary for Policymakers” (2014), Table SPM.1, 12. Available at: http://www.climatechange2013.org/images/report/WG1AR5_SPM_FINAL.pdf

“dangerous climate change,” and to discuss the political benchmarks based on this goal.³²

In general, the lesson is that suggested in my chapter 11: “it is difficult to disentangle the role of past and future emissions. [...] [T]he future emissions that make climate change pose such a large threat do so principally against the backdrop of past emissions [...] [and] the “liability” of the past is in part determined by future behavior” (419-420). More specifically, because of this problem of disentanglement, we should question Pellegrino’s auditorium analogy. One option—that he mentions but dismisses—is to think of a sloped auditorium. In such an auditorium, the first row may inconvenience the second without affecting the views of higher rows. However, I am inclined to think that we should reject the analogy more decisively. For instance, Pellegrino appears to assume that the only option available to succeeding generations is to overemit. But this is surely contentious. First, presumably, there are other ways open to subsequent rows to get a view of the stage, and some of these can also help their successors. For example, there is no need to stand if everyone is offered a hoverchair or the stage itself can be raised up. In this spirit, successful investment in solar energy may mean that high carbon emissions become unappealing. Second, it is also open to the successor generations to remain seated. Maybe they can just listen to the performance. Perhaps this involves taking a loss, but maybe they should do so for the sake of the future. After all, what is at stake for later rows in the climate case is not really the middle-class nightmare of not being able to see the show properly; instead, mainstream projections suggest it is issues such

³² IPCC (2014); Royal Society 2009. *Geoengineering the Climate: Science, Governance, and Uncertainty*.
<http://royalsociety.org/policy/publications/2009/geoengineering-climate>

as famine, disease, relocation and death. Some retrenchment, especially when it comes to “luxuries,” thus seems justifiable.

2. Wider Worlds

The problem of misdiagnosis also infects Pellegrino’s two world framework. First, we need more worlds. In addition to the maximal and lowering-maximizing worlds, there is the possibility of what I shall call rebounding worlds: worlds where at least some earlier generations engage in lowering-maximizing, but later generations can still choose to cooperate. This would remain true even if some generations inflict irreversible harms on all their successors, for the simple reason that successors earlier in the sequence can still make matters much worse for later successors.

Second, though Pellegrino intends his framework to capture the intergenerational storm, it does not fit the spirit of my discussion. In general, Pellegrino’s model is highly specific in a way that implies a radical narrowing of the intergenerational storm. This undermines my attempt to provide a broad and flexible analysis. Most notably, in my book the intergenerational storm is broadly defined in terms of the tyranny of the contemporary, and this is initially presented in terms of a core example. However, the core example does not fit Pellegrino’s two world framework or his auditorium model. It is explicit in that example that the buck-passing is iterated with cumulative effects. Since Pellegrino’s account cannot accommodate this case, it excludes the core case of the intergenerational storm as I introduce it.

V

Ethical Methodology

At the outset of the book, I state that: “sometimes the best way to make progress in solving a problem is to clarify what the problem is” (3), and that the task is to explain why, given that the relevant facts are known, effective action on the global environmental crisis is proving so difficult.

Central to my account is the idea that the climate problem is often misdiagnosed, in general as an essentially scientific, economic and international problem, and more specifically as a traditional tragedy of the commons (or prisoner’s dilemma) played out between nation states who reliably represent the interests of their present and future citizens. Against this, I argue that climate change poses an ethical challenge, and specifically constitutes a perfect moral storm dominated by the tyranny of the contemporary and the problem of moral corruption. In such a storm, the current generation and especially the most affluent face strong temptations to pass the burdens of their activities onto the future, the global poor, and the rest of nature in ways that are morally indefensible.

1. Minimalism

One feature of my approach to clearly identifying the problem is a methodological minimalism. I aim to “couch the ethical risks of our current predicament in the broadest possible terms” (5), to “specify the global environmental tragedy in language that almost

all morally serious people can accept” (5), and to do so while “prejudging as few normative questions as possible.”³³

It is important to notice that methodological minimalism does not entail a refusal to make ethical judgments. On the contrary, I maintain that it is not possible to correctly identify climate change as a problem without making at least some substantive ethical claims, and this is part of my reason for characterizing climate change as an ethical problem. Therefore, the goal of minimalism is not ethical neutrality, understood as the avoidance of ethical claims as such. Instead, the aim is, as far as practicable, to avoid prejudging contentious questions *within ethical theory* when making the substantive ethical claims. Thus, for instance, I seek, as far as possible, to present those ethical claims that are necessary to the analysis without presupposing any particular normative theory or family of theories, such as Millian utilitarianism, Scanlonian contractualism, Rawlsian liberalism, Neo-Aristotelian virtue ethics, and so on.

One illustration of this approach occurs when I introduce the intergenerational storm with a core example involving front-loaded goods that give modest benefits to the group that consumes them (and only to them), but impose very high costs on all later groups. On the one hand, I simply *assert* that “intuitively, the core example poses a moral problem,” so that “other things being equal, it is hard to see how the practice it portrays could be justified” (152). So, I make a substantive ethical claim. Nevertheless, on the other hand, I immediately emphasize that I am not trying to prejudge how this problem should be characterized from the point of view of ethical theory:

³³ This is also represented in my alleged “casualness” about the use of ‘we’ (see Marcello Di Paola, “Climate Change and Moral Corruption,” this issue, at 56. Hereafter ‘DP’), and my avoidance of an overly precise definition of ‘moral corruption’ (J, 46-47).

There are perhaps different ways of describing what has gone wrong. It seems highly plausible to say that the infliction of high costs on later groups for the sake of modest benefits for oneself is at least unfair or unjust. Depending on the case, one might also want to add (*or substitute*) that it is thoughtless, reckless, selfish, cruel, or callous (to mention but a few options). *Still, that there is a moral problem of some kind seems clear enough.* (152; emphases added)

The methodological minimalism with respect to ethical theories is justified for a number of reasons, including the following. First, since the focus of the analysis is on promoting the idea that climate change is an ethical challenge rather than some other kind of problem, it is appropriate to focus on what subsequent ethical theories should seek to explain rather than presupposing a particular explanation. Second, since one central component of the analysis is that the perfect moral storm poses a challenge to ethical theories as such (as manifest in the theoretical storm), violations of methodological minimalism seem premature. Third, the whole approach is rooted in the idea that sometimes problem identification is a useful first step that helps to ground further progress, and an evolving methodological modesty can be an important strategy in the ethics of the transition. In the absence of a widely-accepted and compelling “ideal theory” and especially a theory that one can simply “invoke and apply,” one way to proceed (theoretically and politically) is to see how far one can preserve something like a wide “overlapping consensus” on climate action. Beginning with methodological minimalism in identifying the problem and then seeing how far one can preserve some degree of theoretical modesty moving forward thus seems a promising strategy.

All that being said, my commitment to minimalism is not absolute even at the first stage,³⁴ and I do not expect that strong

³⁴ Hence, my reference to the ‘almost all morally serious people’ (5).

forms of theoretical modesty can be maintained indefinitely.³⁵ In particular, some approaches to climate change may not be able to register that there is a moral problem, or may insist on severely truncating the shape of the problem. For instance, some argue that intergenerational concern can or should extend only over 2-3 generations or so,³⁶ sometimes because this is the limit of “solidarity” among citizens.³⁷ In this spirit, Marcello Di Paola claims that “governments are obligated to their living citizens, first and foremost (and plausibly, but already less stringently, to the next couple of generations of their future citizens [...])” (DP, 57), and that, given this, are “more or less” morally justified in partaking in intergenerational buck-passing. On this view, it seems that such governments can manifest the behavior of the core example—taking modest benefits for 2-3 generations and imposing severe costs on those coming later—and yet fail to be open to moral criticism.

My account of the intergenerational storm resists such positions.³⁸ It takes the view that, other things being equal, this is a moral problem. The thought is that the prospect of intergenerational buck-passing (e.g., especially of the forms

³⁵ Hence, even in the context of introducing minimalism, I go on to say “presumably, potential solutions to the tragedy will have to go further, and make claims that are more controversial” (5).

³⁶ Gardiner and Weisbach, forthcoming.

³⁷ David Heyd, “A Value or An Obligation?” in Lukas Meyer and Axel Gosseries, eds. *Intergenerational Justice* (Oxford: Oxford University Press, 2009).

³⁸ I also have issues with “Businesses are obligated to their living shareholders, first and foremost” (DP, 57). This may not be wrong as stated—since “first and foremost” does not directly imply exclusively or to the expense of all other considerations. Nevertheless, the spirit of Di Paola’s remark does suggest very strong readings of the phrase, or at least a reading strong enough to imply that businesses would be justified in ignoring the moral claims of others. In my view, this is an untenable (although sadly common) view of business ethics and the social role of business.

highlighted in the core example and the tyranny of the contemporary) imposes a strong burden of proof against the 2-3 generation view that most morally serious people would want to meet. I suspect that most solidarity theorists would accept this, and try to meet that burden (e.g., through stories about overlap, accounts of other kinds of moral reasons to take later generations into account, or other institutions to be charged to do it). However, this is not true of all proponents of a 2-3 generation view, and so the perfect moral storm is not morally neutral with respect to them. Instead, it takes a specific ethical stand.

2. *Fairness*

Of course, it is possible to go too far in the other direction. For example, Pellegrino objects that the intergenerational storm presupposes a framework of fairness or justice, and implicitly suggests that this makes my analysis prejudiced against approaches to climate change based on what he calls “beneficence.” In general, I reject this objection.

First, the core example of the intergenerational storm was (deliberately) designed to be compatible with utilitarian-style welfarist intuitions. Specifically, if the current benefits are modest and future costs very high, then the costs clearly outweigh the benefits, and utilitarians have good reason to condemn buck-passing of this kind. Given this, the assumption that such buck-passing poses a moral problem does not beg the question against the utilitarian welfarist.

Second, I am clear that the language of fairness or justice is not essential to characterizing the core example. For example, I say that “depending on the case, one might also want to add (or substitute) that it is thoughtless, reckless, selfish, cruel, or callous (to mention but a few options)” (152),

Nevertheless, there may be more to be said. As I indicate in the book, I believe that it is highly plausible to see the problem in terms of fairness and justice, and (given this) I feel free to frequently characterize the intergenerational storm in this way. Hence, as it happens “*rather than as a presupposition of the perfect moral storm analysis,*” I do think that the aptness of the fairness and justice language is plausible enough to impose a burden of proof on utilitarians and other welfarists to account for that plausibility. In other words, there is some pressure on versions of climate ethics that rely mainly or exclusively on “beneficence” to show why this would not license outcomes that intuitively seem manifestly unfair or unjust, and so to promote a highly truncated account of our moral responsibility to future generations. I do not claim that this burden cannot be met; but I think it is there.

Moreover, in my view the burden is highly relevant in practice, since views of this type do show a strong tendency towards minimizing concern for future people, a tendency exhibited in Pellegrino’s own recommendations. Offhand, they thus seem to encourage a dismissal of the intergenerational storm, and perhaps thereby an endorsement the tyranny of the contemporary, rather than a solution to it. Often, of course, the dismissal takes place under the guise of strongly highlighting the needs of the present and especially the current poor. However, this does not eliminate the burden of proof. Addressing the global storm does not in itself justify ignoring the intergenerational, and can itself be a tempting cover for moral corruption.³⁹

Of course, none of this implies that utilitarian or welfarist views should be dismissed from the outset. Most obviously, there

³⁹ This problem also afflicts rights-based approaches. For example, see my ‘Human Rights in a Hostile Climate.’ In David Reidy and Cindy Holder, eds. *Human Rights: the Hard Questions* (Cambridge: Cambridge University Press, 2013).

is a mainstream utilitarian strategy for dealing with such problems. Indirect utilitarians can argue that commitments to fairness and justice of this sort—e.g., commitments not to engage in intergenerational back-passing as characterized by the core example—are strong promoters of utility over the long-term. In my view, such strategies are highly plausible (whether one is a utilitarian or not), at least as a first step. Moreover, as I say in the chapter on cost-benefit analysis, the neglect of such philosophically popular versions of utilitarianism in policy debate is a large problem that infects discussion of climate change and may itself manifest a corruption of the discourse. One lesson I would draw is that indirect utilitarians should not so easily concede the sole representation of the “welfarist” view to those who favor direct calculation, especially as understood by the rather narrow methods of standard economic cost-benefit analysis (e.g., in terms of market discount rates and prices).

3. Virtue

Another possible methodological objection would be that my account presupposes virtue ethics, since as Di Paola puts it “virtues rather than obligations are in the background of Gardiner’s thought” (DP, 61). It is true that I have a background in virtue ethics and that appeal to such ideas would be an important part of my own theoretical suggestions about how to confront the perfect moral storm. Nevertheless, I do not think that my account of the storm presupposes this tradition in how it characterizes the climate problem, or at least that it does so in a prejudicial way. Instead, I suspect that what is noticeable is that some parts of my account take seriously issues that seem more pressing for virtue-based approaches, and which some opponents would therefore wish to ignore (e.g., the idea of tarnishing evils in chapter 10). However, in my view to omit these issues just for

this reason seems to amount to a prejudice against virtue. Accommodating such a prejudice would impoverish our sense of what the problem is, and compromise the effort to defend the claim that it is an ethical problem. It would also lead us to underestimate the need for other theoretical approaches to respond to these issues.

4. Resolves

In the end, of course, one cannot maintain minimalism forever. Indeed, even overlapping consensus requires development of the various views subject to that consensus, and such consensus may not apply to all aspects of the climate debate. Thus, there is a pressing need for more “ideal theory,” and so for expansion. In addition, though modesty may be helpful as part of the ethics of the transition, at some point such an ethics may also simply have to take a stand. Indeed, it is possible that in the end fairly specific and controversial ethical claims are the best (or even the only) hope for motivating change.⁴⁰ Even given the initial theoretical modesty, I do not rule this out. The perfect moral storm analysis aims to facilitate this discussion, not prevent it.

Still, some approaches do strike me as too rigid and dogmatic. For example, though (when stepping away from modesty) I agree with Di Paola that virtue can play a key role in addressing the perfect moral storm, I am uncomfortable with his idea that agents should simply “resolve” to address climate change, where this involves an intention “especially designed to stand firm in the face of contrary inclinations and/or dissonant information” where “their pursuit is non-contingent on the behavior of

⁴⁰ E.g., Dale Jamieson, “Climate Change, Responsibility and Justice,” *Science and Engineering Ethics* 16 (2010), 431-445.

others,” and the reasons for grounding their adoption are unimportant.

Offhand, this kind of entrenchment strikes me as too extreme. In my view, virtue is grounded in reasons, open to new information, and sensitive to variation in situations. Hence, cultivating firm nonrational entrenchment of some views is generally an undesirable approach, and likely to lead to wider social problems if practiced more widely.

Of course, I also suggest that some kinds of strength of character and institutional robustness are required for holding firm to pre-theoretical commitments in the face of the perfect moral storm, and especially given the theoretical storm and the problem of moral corruption. However, for me both the reasons underlying the pretheoretical commitments and the standing threats are important. Not only can they play a role in guiding an appropriate defensive ethics, but they also suggest some limits to defensiveness. In cases where a relevant virtue is not yet developed, Aristotle would urge us to lean towards the extreme to which we are naturally less inclined. This, rather than dogmatic entrenchment, seems good advice for an emerging ethics of the transition.

VI

The Theoretical Storm

A further worry about the resolve suggestion is that it seems to presuppose that we already know what to entrench, whereas on my view there is a theoretical storm to confront, and so the way forward is less clear and less secure.

1. *Clear Cases*

This leads us to another objection. In my discussion of the Dashwood case, Di Paola claims that I “make a peculiar move,” “where we are suddenly rescued from the theoretical storm and transposed onto a placid moral shore” (DP, 63). Specifically, Di Paola suggests that I suddenly “factor out” the theoretical storm by presupposing that duties of global and intergenerational justice not only exist, but consist in clear moral requirements.

My response is that it is not a violation of the theoretical storm to appeal to some ethical considerations. The theoretical storm rests on the idea that we lack robust theories in the relevant areas, not that we lack the ability to make any ethical judgments at all. This move is signaled very early in the book:

“Even given the theoretical storm, the broad outlines of what must be done are relatively clear and well-known, especially in the short- to medium-term (see chapter 11). Even lacking robust theory, intermediate guidance is possible using indirect methods, such as identifying intuitively clear cases of failure, trying to articulate ethical constraints based on those cases, searching for levels of overlapping consensus across existing theories, and defending such benchmarks against the forces of moral corruption.” (10; emphases added)

It is also signaled in my endorsement of the following quotation from Rawls:

It does not follow [from the severity of the theoretical problems] [...] that certain significant ethical constraints cannot be formulated. [...] it may often be clear that a suggested answer is mistaken even if an alternative doctrine is not ready to hand” (184).⁴¹

Hence, in the parallel with the Dashwood case, I presuppose that there are some norms of global and intergenerational ethics,

⁴¹ John Rawls, *A Theory of Justice*, rev. ed. (Cambridge (MA): Harvard University Press 1999), 253.

and that it is clear that these are violated by the recent history of international climate policy. However, this does not imply that there is no theoretical storm. The claim that such norms exist and we can identify clear cases of violation does not at all imply that we have robust theories to guide us.

2. The Promise of Justice

As part of this objection, Di Paola resists drawing a parallel between John Dashwood's promise making and the aforementioned norms. This is a comment I have heard a number of times. In one way, I confess that in the past I have been inclined not to take it very seriously. In the end the analogy does not require a very tight correspondence between John's reasons for action and ours. It is enough that both John and we have strong moral reasons to act well. Hence, for my purposes, focusing on this dispute somewhat misses the point of the example.

Nevertheless, I do think that the analogy is stronger than the objection recognizes. Let us begin with basic objection that John makes an explicit promise and we do not. This strikes me as false. In the United Nations Framework Convention on Climate Change, the nations of the world explicitly committed themselves to "the protection of current and future generations of mankind," and the specific objective of preventing "dangerous anthropogenic interference" in the climate system. This convention was subsequently ratified by virtually all nations, included the large and emerging emitters, such as the United States, China, the European Union, Russia and India. Subsequently, the leading nations have repeatedly endorsed the general goals of the UNFCCC. More recently, in the Copenhagen Accord of 2009, they have also committed themselves to

interpreting “preventing dangerous anthropogenic interference” in terms of the goal of restricting climate change to 2 degrees. In short, in highly relevant respects we have promised, very publicly and explicitly.

More tellingly, in my view, in both cases the moral issues at stake are much deeper than the explicit agreement to address them. Henry Dashwood has strong moral reasons for asking the promise of John, John recognizes these reasons when he makes the promise, and in large part agrees because of this. As a result, John’s duty to act is to some extent independent of the explicit promise, and would remain strong even without the promise. The same is true in our case. For example, even if the UNFCCC had never been negotiated and ratified, most of our moral reason to act on climate change would remain and be equally strong. Though the fact that we promised makes a difference, it is only a relatively small difference.

Di Paola dismisses my claims about John as “conjectural.” This strikes me as too quick. In particular, the subsequent nature of Fanny’s reasoning and the historical context count against it. On the first, even Fanny recognizes that she needs strong counterarguments, and that the burden of proof is on her. Rather than dismissing the norms directly, she attacks their applicability in cases of “half-blood,” and argues that their application to his half-sisters is superceded by John’s closer attachment to his own son. Notably, the latter argument requires presupposing some intergenerational norms. On the second, can we really imagine (morally-speaking) John saying simply, “No, Father: the money’s mine and I’ll do as I see fit, whatever the consequences for my siblings”? Would it be any less morally preposterous for us to say, “No, future people: the power is ours and we intend to use it whatever the consequences for you”? To me, the idea that our

generation may leave as its epitaph “We made no promises” is a morally chilling prospect.

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SYMPOSIUM
A CHANGING MORAL CLIMATE



THE INDIVIDUAL'S OBLIGATION TO RELINQUISH
UNNECESSARY GREENHOUSE-GAS-EMITTING
DEVICES

BY JOHN NOLT

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The Individual's Obligation to Relinquish Unnecessary Greenhouse-Gas-Emitting Devices

John Nolt

Abstract. The use of many common devices requires the emission of greenhouse gases. Examples include internal combustion engines, most heating and cooling devices, and anything that uses electrical power some of which is generated by the burning of fossil fuels. Most current schemes for reducing greenhouse gas emissions take it for granted that individuals will continue using such devices. These schemes aim, for example, to sequester the emissions or switch the energy source to wind, solar or nuclear power. But this paper contends that the potential harm of global climate change is so great and the need for emissions reduction so urgent that where the use of greenhouse-gas-emitting devices is *unnecessary* (that is, eliminable without violating overriding moral obligations), we have a moral obligation simply to stop using them.

I

Introduction

The use of many common devices requires the emission of greenhouse gases. Examples include internal combustion engines, most heating and cooling devices, and anything that uses electrical power some of which is generated by the burning of fossil fuels. Most current schemes for reducing greenhouse gas emissions take it for granted that individuals will continue using such devices. These schemes aim, for example, to sequester the emissions or switch the energy source to wind, solar or nuclear power. But this paper contends that the potential harm of global climate change is so great and the need for emissions reduction so urgent that where the use of greenhouse-gas-emitting devices is *unnecessary* (that is, eliminable without violating overriding moral obligations), we have a moral obligation simply to stop using them.

The argument for this claim is as follows:

1. The harms of greenhouse gas emissions are so great and continue over such a long time that even the emissions of single individuals contribute significantly to the bodily harm of others.
2. Many uses by individuals of greenhouse-gas-producing devices are unnecessary.
3. In most cases, such devices cannot soon be powered in ways that do not produce greenhouse gases.
4. One may not contribute significantly and unnecessarily to the bodily harm of others.

So

5. We are morally obligated to not to use such devices unnecessarily.

My presentation is divided into three parts. §II lays out and defends the premises of this argument. §III considers and responds to objections. §IV discusses strategies for eliminating unnecessary uses of greenhouse-gas-producing devices.

A word about scope: this paper is concerned exclusively with individual obligations to refrain from using these devices. I hold, of course, that individuals also ought to support political efforts to mitigate climate change. And I recognize that the obligations of individuals pale beside those of corporations and governments. Still, I will consider here only what an individual ought to do (or refrain from doing), for (as I hope to show) her personal greenhouse gas emissions are also morally important.

II

The Argument

This part explains and defends each of the argument's premises.

Premise 1: The Harms of Small Emissions

According to premise 1, the harms of greenhouse gas emissions are so great and continue over such a long time that even the emissions of single individuals contribute significantly to the bodily harm of others. The argument for this premise, in a

nutshell, is as follows. The already considerable global harm per unit time (e.g., per year) from humanity's current and historic greenhouse gas emissions is increasing and will continue for centuries. Its degree depends directly and continuously on global average temperature. But global average temperature over the coming centuries depends in turn directly and continuously on cumulative total CO₂ emissions. Therefore, even small emissions, such as those of individuals, contribute significantly to the cumulative total harm. A more detailed explanation follows.

Consider first that the harm from humanity's greenhouse gas emissions is already great. This is because we have already made the atmosphere and oceans hotter than is optimal for both human and non-human life. According to the World Health Organization, "Global warming [...] caused over 140,000 excess deaths annually by the year 2004."¹ A 2009 study by the Global Humanitarian Forum (a United Nations affiliate) estimated the current death toll from climate change at 300,000 people annually, nearly all of them in developing nations.² A 2012 report by Development Assistance Research Associates puts the current annual death toll from climate change at 400,000 (nearly all in developing nations) and projects that by 2030 it will rise to nearly 700,000.³ One may dispute the details of these estimates, but the fact that climate change is already causing large numbers of

¹ World Health Organization, "Climate change and health" fact sheet, October 2012, accessed July 4, 2013, <http://www.who.int/mediacentre/factsheets/fs266/en/index.html>.

² "Climate Change: The Anatomy of a Silent Crisis," Global Humanitarian Forum, 2009, accessed January 14, 2013, <http://www.ghf-ge.org/human-impact-report.pdf>.

³ "Climate Vulnerability Monitor," 2nd ed., Development Assistance Research Associates (DARA), 2012, accessed January 14, 2013, <http://daraint.org/climate-vulnerability-monitor/climate-vulnerability-monitor-2012/report/>.

human deaths is beyond doubt—as is the fact that the death rate is increasing.

The Intergovernmental Panel on Climate Change (IPCC) warns that “climate change over the next century is *likely* to adversely affect hundreds of millions of people through increased coastal flooding, reductions in water supplies, increased malnutrition and increased health impacts.”⁴ These adverse effects include sickness, injury and death. Moreover such harms will not be confined just to the next century.⁵ Elsewhere I have argued that the number of people “adversely affected” by climate change during the next millennium will be in the billions.⁶

The effects of anthropogenic climate change on non-human life will also be profound, but consideration of bodily harm to humans alone suffices, I think, to make a strong case for eliminating unnecessary uses of greenhouse gas devices. Since it also yields an elegantly simple argument, it is the strategy I will follow here.

Though the mechanisms of these bodily harms are various, nearly all hinge in one way or another on rising temperatures. Moreover, global average temperature is directly influenced by humanity’s greenhouse gas emissions. When released into the atmosphere, greenhouse gases absorb and retain heat that would otherwise be radiated into space. Each molecule of a greenhouse gas has, individually, the capacity to retain some of this heat. It follows that, other things being equal, any increase in the

⁴ Intergovernmental Panel on Climate Change (IPCC), *Climate Change 2007: Synthesis Report* (Cambridge: Cambridge University Press, 2007), 65.

⁵ IPCC, *Climate Change 2007: Synthesis Report*, 47.

⁶ John Nolt, “How Harmful Are the Average American’s Greenhouse Gas Emissions?” *Ethics, Policy and Environment* 14, (2011), 3-10; and John Nolt, “Replies to Critics of ‘How Harmful Are the Average American’s Greenhouse Gas Emissions?’” *Ethics, Policy and Environment* 16, (2013), 111-119.

atmospheric greenhouse gas content raises, however slightly, the global average temperature.

Furthermore, elevated heat retention persists for however long a portion of the emitted gas remains in the atmosphere. In the case of carbon dioxide the time is long indeed. In a recent comprehensive review of the literature on the atmospheric lifetime of fossil fuel carbon dioxide, Archer, et. al., found that “The models agree that 20–35% of the CO₂ remains in the atmosphere after equilibration with the ocean (2–20 centuries).”⁷ Suppose, then, that a person emits a quantity of CO₂ today. The additional quantity will immediately begin contributing to global heat retention. Over time, some will be removed from the atmosphere, chiefly by being dissolved in the oceans (where, incidentally, it will contribute to acidification). But a substantial portion will remain in the atmosphere for centuries, continually contributing to the warming of the atmosphere and hence of the land and oceans. Therefore, other things being equal, any given CO₂ emission contributes to increased global average temperature, not just in the following years or decades, but for centuries.

Of course, other things are not equal. Global average atmospheric temperature is also affected by many other variables, including volcanic activity; solar irradiance; feedback loops (as when methane, a greenhouse gas, is released from melting tundra); and short-term exchanges of CO₂ and heat between oceans or vegetation and the atmosphere. Therefore, atmospheric temperature increases due to increased CO₂ concentrations can for a time be masked by these other phenomena. That is why the plot of global average temperature over the last few decades (whether measured in the atmosphere, the oceans, or both) is a

⁷ David Archer, et. al., “Atmospheric Lifetime of Fossil Fuel Carbon Dioxide,” *Annual Review of Earth and Planetary Sciences* 37 (2009), 117.

jagged but steadily rising line. Were it possible to hold these other variables constant, the jaggedness would disappear. Global average atmospheric temperature would in theory rise smoothly and continuously with atmospheric CO₂ concentration. This follows almost immediately from the fact that retention of heat (a form of kinetic energy) increases directly with atmospheric CO₂, together with the law of conservation of energy.

The duration of excess CO₂ in the atmosphere has an important implication regarding emissions: global average temperature over the coming centuries will be largely insensitive to their rate and timing, being strongly correlated instead with their cumulative total.⁸ Thus it doesn't matter much when and at what rate we and our immediate successors emit CO₂. What matters is how much we emit.

The degree to which global average temperature depends on carbon concentrations is only approximately known. According to the IPCC, the long-term global average temperature increase for a doubling of the CO₂ concentration is “*likely* to be in the range of 2 to 4.5°C with a best estimate of about 3°C, and is *very unlikely* to be less than 1.5°C. Values substantially higher than 4.5°C cannot be excluded, but agreement of models with observations is not as good for those values.”⁹ Given that a doubling of the CO₂ concentration is necessary to raise the temperature, say 3°C, then to raise it 6°C, four times that concentration is needed, to raise it 9°C, eight times that concentration is needed, and so on. Each additional increment of CO₂ therefore produces a somewhat smaller increase in

⁸ Myles R. Allen, *et. al.*, “Warming Caused by Cumulative Carbon Emissions towards the Trillionth Tonne,” *Nature* 458 (2009), 1163-6. It may also be possible to control global temperature by geo-engineering, which is discussed briefly below.

⁹ IPCC, *Climate Change 2007: Synthesis Report*, 38.

temperature. It would be a mistake, however, to infer that each additional increment produces a smaller increase in harm, for we have yet to consider how harm depends on temperature.

Certain features of this dependency are readily apparent. Given that the world is already overheated, harm obviously increases with temperature. This is true whether harm is aggregated per unit time (per year, for example) or as a cumulative total that includes all the bodily harms attributable to anthropogenic climate change for however long they last.¹⁰

Moreover (and this is crucial for what follows) the increase of harm with temperature is more or less continuous. This is because, except when it takes the form of death, harm is generally a matter of degree. A little more heat in a drought, for example, incrementally decreases crop yields and water availability, thus incrementally increasing hunger, thirst and the health effects thereof. A slight rise in the velocity of heat-driven storm winds slightly increases the severity of resulting injuries. The number of instances of harm (*per annum*, let's say) is, moreover, already large. Since injuries and harms of deprivation are continuously variable in severity, bodily harm *per annum* must also rise more or less continuously with global average temperature. But (leaving aside the confounding variables mentioned above) global average temperature itself rises smoothly and continuously with cumulative emissions. Therefore, cumulative harm (over, say the next millennium) increases more or less continuously with cumulative total emissions. It follows that even small CO₂ emissions increase total harm.

¹⁰ It is doubtful that all these kinds of harm are comparable. If so, aggregation might require partitioning them into categories of comparable harms. My claim would then be that harms in each of these categories increase monotonically and more or less continuously as temperatures increase.

It seems quite likely, furthermore, that harms increase more than proportionally to temperature increases—at least until life on Earth becomes severely depleted. There are various reasons for this. Perhaps the most general is that the tolerable temperature ranges for populations of humans, livestock, crops, and other organisms on which humans depend (including those that supply ecosystem services), tend to exhibit a normal distribution—that is, a bell curve. Moving from the center toward the high-temperature end of such ranges at first produces little harm, but then, precipitously, accelerating harm, followed (when nearly all possible harm has been done) by a decelerated decline to extinction.¹¹

Given these considerations, how small an emission, then, can contribute significantly to harm? The emissions of single individuals, even those of affluent individuals, are, of course, comparatively miniscule. Whatever damage they do may seem, intuitively, to be negligible.¹² But intuitions concerning complex phenomena of large and unfamiliar extent are often unreliable. The intuitions in question are, moreover, suspect in another way: the conviction that I am doing no harm may be comforting, even self-serving, hence prejudicial. Climate change is, in Stephen Gardiner’s memorable phrase, a “perfect moral storm,” rife with enticements to moral and intellectual corruption.¹³ We should

¹¹ For more on why harm accelerates with increasing temperatures, see John Broome, *Climate Matters: Ethics is a Warming World*, (New York: W.W. Norton & Company, 2012), 33-6.

¹² For a defense of these intuitions, see Walter Sinnott-Armstrong, “It’s Not My Fault: Global Warming and Individual Moral Obligations,” in *Perspectives on Climate Change: Science, Economics, Politics and Ethics, Advances in the Economics of Environmental Resources*, vol. 4, Walter Sinnott-Armstrong and Richard B. Howarth, eds., (Amsterdam: Elsevier, 2005), 289.

¹³ Stephen M. Gardiner, *A Perfect Moral Storm: The Ethical Tragedy of Climate Change* (Oxford: Oxford University Press, 2011).

not, therefore, take the harmlessness of individual emissions for granted.

In order to challenge the assumption that the harm of individual emissions is negligible, I have elsewhere attempted to calculate the human casualty rate per U.S. citizen for lifetime greenhouse gas emissions. It turns out that the average American's share of the total anthropogenic emissions from the beginning of the industrial revolution to 2040 is about one two-billionth. Given that over the coming centuries it seems likely that billions of people will suffer and/or die as a result of climate change, I infer that the average American's share of the responsibility, through his or her complicity in humanity's collective GHG emissions, amounts to the suffering and/or deaths of roughly one or two future people.¹⁴ This estimate, of course, is quite crude. And we should keep in mind that emissions differ widely between high consumers and low consumers, between the rich and the poor. The number might be much higher for those who consume an extraordinary amount of fossil fuel by for example, having large homes or multiple homes, flying frequently, driving large, inefficient vehicles, etc. In any case, this estimate suggests that individual emissions can contribute significantly to the bodily harm of others.

Of course no particular harm is attributable to the emissions of any specific individual. The CO₂ for which one individual is responsible is mixed in the atmosphere with the CO₂ from all other sources, and the harm results from the aggregate. But the cumulative harm over centuries is so vast and so directly dependent on total CO₂ emissions that even small emissions contribute significantly to that aggregate. Therefore, although it makes no sense to attribute particular harms to a given individual, it does make sense to attribute to her some small fraction of the

¹⁴ J. Nolt, "How Harmful," and J. Nolt, "Replies to Critics."

vast quantity of total bodily harms that our emissions will produce over the coming centuries.

Premise 2: Unnecessary Emissions

Of course even if an individual's emissions are contributing significantly to the bodily harm of others, it does not follow immediately that she ought to eliminate them. To do so could be too costly, especially if she is poor. But among the affluent there are many cases in which the perceived benefit of some use of fossil fuels is actually trivial, or perhaps, all things considered, not really a benefit at all. Residential leaf blowers, for example, which are common in some developed nations, are generally unnecessary and—given the noise, pollution, cost, loss of exercise, etc.—may do more harm than good. Indeed, many devices whose use commonly requires the emission of greenhouse gases are in most of their uses *unnecessary*. Other examples include: jet skis, SUVs, clothes dryers¹⁵, big screen TVs, hot tubs and decorative electric lighting.

For any such devices, no doubt, one can find or imagine necessary uses. But these are not typical. In characterizing these devices as “unnecessary,” I am referring to their common uses, not to any extraordinary, necessary ones they may acquire. It may be that no device is always either necessary or unnecessary, but the sorts of devices mentioned here are generally not necessary.

¹⁵ Clothes dryers are unnecessary in places wherever their primary function can be accomplished by drying on an outdoor line or indoor rack without violating overriding moral obligations. For a personal account of the *joys* of line drying, see John Nolt, *Down To Earth: Toward a Philosophy of Nonviolent Living* (Washburn, Tennessee: Earth Knows Publications, 1995), 46-8.

Premise 2 claims that many uses by individuals of greenhouse-gas-producing devices are unnecessary. The term “necessary” is intended here in a moral sense: the use of a greenhouse-gas-emitting device is *necessary* if its non-use would violate overriding moral obligations—that is, only if there are no morally acceptable alternatives. The tractors needed to cultivate and harvest crops, for example, or the trucks needed to transport them to population centers are necessary in this sense. No adequate carbon-neutral alternatives are widely available; hence, since food is a human need, continued use of petroleum-fueled trucks and tractors is for now justifiable.

Even where carbon neutral alternatives exist, some greenhouse-gas-emitting devices may still be necessary. Given their other morally salient obligations, not many people can afford to replace conventional home power and heating systems with photovoltaic and geothermal systems or other carbon-neutral alternatives. Hence, for now, for many people, even in developed nations, fossil-fuel powered heating and electrical systems are still necessary.

Moreover, not all unnecessary devices are *independently* unnecessary. I may not need either an SUV or a pickup truck or a mini-van, but my job might require that I own at least one of these vehicles. So, while each is unnecessary for me, the disjunction may be necessary. Still, most affluent people employ many independently unnecessary greenhouse-gas-emitting devices.

It is not possible to specify here exactly which uses of greenhouse gas-emitting devices are necessary and which are not. Since moral obligations vary depending on the individual’s social responsibilities and commitments, so does necessity, which entails the non-existence of overriding moral obligations. Nor would it be to the point here to try to define exactly what counts

as an overriding moral obligation. The examples offered above are sufficient to show that on any reasonable construal of necessity in this moral sense, many current uses of greenhouse-gas-emitting devices, especially among the affluent, are unnecessary. That is obvious in any case, and is all that premise 2 claims.

Premise 3: The Unavailability of Carbon-Free Energy Sources

It might not make sense to go to the trouble of relinquishing use of unnecessary devices if we could be reasonably sure that we could soon power them in a carbon-neutral way. But most of the greenhouse-gas-emitting devices currently in use will in fact not be so-powered anytime soon. Despite decades of development of wind, photovoltaic, biomass, hydroelectric and geothermal energy sources, by 2020 these will, according to the U.S. Energy Information Administration, still supply less than 15 percent of the global total. Nuclear power will account for about 10 percent. The remaining energy, over 75 percent, will be still supplied by fossil fuels.¹⁶ Thus the day when the energy used by most of the world's population comes from carbon-neutral sources is still probably decades away. Some affluent people can afford the investment now to generate their own power sustainably with photovoltaic panels, geothermal devices and the like. This is a beneficial thing to do—though less so, perhaps, if the aim is to “guiltlessly” maintain high rates of consumption. But many of those who cannot afford such an investment can still reduce their

¹⁶ U.S. Energy Information Administration, “World total energy consumption by region and fuel,” accessed January 14 2013, http://www.eia.gov/oiaf/aeo/tablebrowser/#release=IEO2011&subject=0-IEO2011&table=2-IEO2011®ion=0-0&cases=Reference-0504a_1630

carbon footprints by reducing or eliminating unnecessary use of devices powered by greenhouse-gas-emitting energy sources.

Premise 4: A Moral Principle

The argument's moral claim is premise 4: one may not contribute significantly and unnecessarily to the bodily harm of others. Necessity, once again, implies overriding moral reason. Premise 4 is supportable by most, if not all, widely recognized moral theories. This is certainly true for deontological theories, nearly all of which endorse fairly robust principles of non-harm. Consequentialist theories, by contrast, typically permit bodily harm for the sake of greater benefit. But for many uses of the greenhouse-gas-emitting technologies that we are considering, it would be very difficult to make the case that the benefit outweighs the harm. Those uses, then, reasonably count as unnecessary, even on consequentialist theories. Rule consequentialist theories in particular, recognizing human moral frailty, generally require adherence to such principles of non-harm as rule 4, allowing exceptions, if at all, only where due consideration shows very clearly that following the principle does not promote the good. Premise 4 is also quite plausible on virtue ethics.

My use of this premise has little claim to originality. Avram Hiller has employed a similar principle to argue for a somewhat similar conclusion. Hiller's principle is, "it is *prima facie* wrong to perform an act which has an expected amount of harm greater than another easily available alternative."¹⁷ This, presumably, means that it *is* wrong unless there are overriding moral reasons

¹⁷ Avram Hiller, "Climate Change and Individual Responsibility," *The Monist* 94, (2011), 352.

to do it—that is, to use my terminology, it is wrong if unnecessary. Hiller makes it clear that in many cases he considers refraining from using a greenhouse-gas-producing device to be an easily available alternative. To that extent, Hiller’s moral assumption and his overall argument are similar to mine.

The most important difference, I think, is that Hiller regards the harm of individual emissions as intermittent or probabilistic (hence his use of the notion of *expected* harm), whereas I assert the continuous dependence of harm on cumulative emissions. In other words, I regard harm from individual emissions as, not merely probable, but practically certain.

According to Hiller, “climate change is a threshold phenomenon.”¹⁸ That is, increasing emissions may for some time produce no additional harm and then suddenly (by, for example, some feedback mechanism such as the release of methane from melting tundra) contribute to significant harm. The thought seems to be that emissions prior to the crossing of the threshold are harmless until the threshold is crossed, and that the crossing of it is not certain.

It is, of course, quite likely that there are cumulative emission thresholds beyond which harm suddenly accelerates. However, given that the harms of climate change are numerous and that many of them are matters of degree and continuously temperature-dependent, I can see no reason to believe that emissions that occur before such a threshold is crossed contribute to no harm at all.

But let’s grant for the sake of argument that there are periods prior to threshold-crossings during which relatively small emissions do not contribute to harm. Suppose, for example, that my emissions from driving a car have no effect before some

¹⁸ A. Hiller, “Individual Responsibility,” 358.

threshold is crossed several decades from now. Still (as Hiller would agree) they are not harmless. Rather, they are part of the cumulative total that precipitates the crossing of that threshold. If many recklessly lade a camel with straw, the breaking of the camel's back is not the fault solely of the one who adds the last straw.

Now here is the crucial point: it is practically certain that not only that threshold but many others like it to which my emissions also contribute *will* be crossed. The harm to which a given emission contributes is not a one-time affair; for, as we have noted, CO₂ is long-lived in the atmosphere. Its continuing effects, enhanced by various feedback mechanisms, are longer-lived still. In their survey of climate models Archer, *et. al.*, conclude:

Nowhere in these model results or in the published literature is there any reason to conclude that the effects of CO₂ release will be substantially confined to just a few centuries. In contrast, generally accepted modern understanding of the global carbon cycle indicates that climate effects of CO₂ releases to the atmosphere will persist for tens, if not hundreds, of thousands of years into the future.¹⁹

The harms of an individual's emissions do not, therefore, cease with the crossing of one threshold. To suppose, then, that current emissions might not be harmful because they do not suffice to cross some particular threshold is to misconceive the nature of the harms of greenhouse gas emissions. It is practically certain that my emissions will contribute to the crossing of many thresholds and the causation of many harms.

We have derived this conclusion under the assumption (which I attributed to Hiller) that there are periods prior to threshold-crossings during which relatively small emissions have no harmful effects. I, however, reject this assumption; for, as I have argued

¹⁹ D. Archer *et. al.*, "Atmospheric Lifetime," 131.

above, cumulative harm increases more or less continuously with cumulative total emissions. The harms to which individual emissions contribute are therefore practically certain, not merely probable. Hence we need not appeal to the probabilistic notion of *expected* harm in premise 4.

I conclude categorically that individuals are morally obligated not to use greenhouse-gas-producing devices unnecessarily.

III

Objections and Replies

Premise 1 may give rise to various objections. In this part, I attempt to answer some of these, and also to consider some objections that might be raised against other aspects of the argument.

Geoengineering

It might be argued against premise 1 that the harms of climate change will be considerably less enduring and severe than I have suggested, because once they get bad enough humanity will reverse climate change by geoengineering. But apart from biologically-based schemes, such as the planting of trees, all geoengineering techniques are untested at large scales, dubious in efficacy, potentially dangerous, ethically questionable,²⁰ and unlikely to be deployed in the near future.

Even tree-planting is effective only with perpetual management or artificial sequestration of the carbon captured by

²⁰ S. Gardiner, *A Perfect Moral Storm*, ch. 10.

the trees. If we plant trees enough to offset a certain quantity of carbon emissions today and later these trees are cut and used in a way that releases their carbon content, then the sequestered carbon will be returned to the atmosphere, and in the long run it will be as if we had not planted the trees at all. For such reasons many extant carbon offset schemes are of dubious long-term value.

Geoengineering will certainly not prevent harms that are occurring now or that will occur in the coming decades, since it would take decades to put planet-wide geoengineering schemes into action. Moreover the costs of geoengineering schemes, assuming they are implemented, are themselves harms, to be borne by future people. Also, no effective geoengineering scheme is likely to be totally benign. Each itself causes some harms directly. Some may also cause indirect harms, such as the international conflict that could result should any nation or group of nations try to implement them. For such reasons, it is not at all certain that any effective geoengineering technique will ever be deployed—or that, if it were, the benefits would be worth the costs. Whatever hope lies in geoengineering therefore seems insufficient to negate our obligation to relinquish unnecessary uses of greenhouse-gas-producing devices now.

Discounting

Advocates of the use of cost-benefit analysis in long-range decision-making are likely to object to premise 1 that since many of the harms caused by current emissions occur far in the future, they should be discounted to such an extent that they are negligible now. Discounting is the practice of valuing future outcomes, regardless of whether they are gains or losses, less than

present ones. The more distant they are in the future, that is, the more closely their value approaches zero.

Discounting is often well justified in short-term economic and policy decisions. But, even assuming a consequentialist ethic, discounting has no valid justification for moral decisions involving bodily harm and loss of life to future people. To show this, however, requires a careful survey and critique of discounting's various, often conflicting, justifications—something well beyond the scope of this paper. Fortunately, such critiques already exist. One of the best is still Derek Parfit's.²¹

Non-Identity Objection

There is another very different sort of objection that is often discussed in the philosophical literature—an objection based on the widely debated non-identity problem. Since I have dealt with this objection elsewhere,²² my discussion of it here will be brief. In the present context, it amounts to the claim that premise 1 is false, because climate change will not harm people in the distant future.

This objection is best understood from the point of view of those people living centuries hence whom I claim will be harmed by our emissions. The problem is that they will owe their existence to these very same emissions. For had we and our contemporaries (contrary to fact) quickly and deeply reduced greenhouse gas emissions so as to save them from harm, then they would never have been born. This is because such an achievement would have required great social and economic

²¹ Derek Parfit, *Reasons and Persons* (Oxford: Clarendon Press, 1984), Appendix F.

²² J. Nolt, "Replies to Critics," 114-16.

reorganization. Many people would have had different careers or lived in different cities, and their children would have had children with different mates. Over generations, the creation of people different from those who would have existed without the policy change would ramify through the global population. Therefore those people in the far future whom we sought to protect from climate change would never have been born, and another population entirely would exist in their place.

But, claims the objection, people are harmed by an action only if it makes them worse off than they would otherwise have been. Since the very existence of the distant future people whom I claim we are harming depends on our continuing emissions, they are not made worse off by our actions than they otherwise would have been; for it is not worse to live and suffer harm from climate change than never to live at all. Hence our emissions do not harm them—so the objection contends.

The main problem with this objection lies in the criterion of harm that it employs. It is simply false that people are harmed by an action only if it makes them worse off than they would otherwise have been. To see why, suppose that humanity does not substantially reduce emissions and severe climate change results and imagine a person living, say, a couple of centuries hence. Her life, we may suppose, is hard because of the degraded climate in which she lives. She is, however, generally healthy. But suddenly she is killed by a hurricane that was made lethally powerful by our emissions. Our actions result both in her existence and, after she comes into existence, her death. In killing her, in an obvious and morally relevant sense they harm her. Advocates of the objection, however, deny that she is harmed. They think we should lump both results of our emissions together and use the ensemble to determine whether those emissions cause harm. But why? The two consequences are

separable. Our actions first contributed to her existence. When her life began, she became susceptible to harm. Later, our actions harmed her. We may grant that, on the whole, the life she had was best for her, perhaps even the only life she could have lived. Still, living the best life one could have lived, or even the only life one could have lived, does not preclude being harmed in a morally relevant sense. Proponents of the non-identity objection are mistakenly committed to the belief that it does.

Hale's Objection

Another sort of objection takes aim at my moral premise, premise 4: one may not contribute significantly and unnecessarily to the bodily harm of others. Act consequentialists, in particular, may deny this premise, on the ground that if the harm is inevitable, then whether we contribute to it or not makes no difference to the permissibility of our actions. Benjamin Hale argues that massive climate change *is* inevitable because, for psychological and economic reasons, market incentives will, absent certain unlikely conditions, cause all the earth's fossil fuels to be consumed.²³ This prediction is, of course, uncertain. But suppose it is true. Then, given that the harm of climate change is dependent largely on cumulative total emissions, an individual's emissions do indeed make little difference to the cumulative harm that eventually results, for others will burn whatever fuel she saves. At best, an individual might, by refraining from emissions, delay some harms slightly. But comparable harms will nevertheless eventually occur. There seems, therefore, to be no act consequentialist reason for individuals to limit their emissions.

²³ Benjamin Hale, "Nonrenewable Resources and the Inevitability of Outcomes," *The Monist* 94 (2011), 369-390.

This depends, however, on the uncertain assumption that all fossil fuels will eventually be burned. Given that there is a chance that humanity will switch to sustainable energy sources before this comes to pass, by limiting our emissions we increase at least the probability of a better outcome. Thus we still have an act consequentialist justification for eliminating unnecessary emissions.

Even if, however, the consumption of all the fossil fuels on earth were known to be inevitable, there would still be an act consequentialist reason to conserve now. For, in that case, people living near the end of the fossil fuel era would likely be in dire straits. Some of them might need fossil fuels just to survive. Act consequentialism would advise us, then, to eliminate our unnecessary emissions in order to save some fuel for them.

Finally, suppose that the burning of all fossil fuels were certain, and that it was also certain that no one would need them after they were used up. In that case, of course, we genuinely could not affect the overall outcome. But still we would still have *non-consequentialist* reasons for conserving now. (This, precisely, is Hale's point.) Non-consequentialists can argue that we ought to avoid contributing to unnecessary bodily harm, whether or not others are doing so, and whether or not our doing so affects the outcome. Hence, they can readily conclude, we still ought to eliminate our harmful and unnecessary emissions. Non-consequentialist justifications for premise 4 are therefore unaffected by the objection.

Compensatory Benefits

We benefit future people through our development of science, technology, medicine and the arts. Another objection asks: why

don't these benefits compensate for and hence justify the harms of our emissions?

Some emissions may well be justifiable in this way. But the specific emissions at issue here—those that are unnecessary—are not justified by overriding moral reasons (including compensatory benefits to future people). Compensatory benefits claims are thus irrelevant to my argument.

The Demandingness Objection

Still, my conclusion may seem excessively demanding to many. In response to such demanding imperatives, some authors have sought to limit individual responsibilities by adopting a principle, known as an “agent-centered prerogative,” according which each person may give greater weight to her own interests than to the interests of any other person.²⁴ According to this principle, we may appropriate to ourselves the wherewithal for a fulfilling life before worrying about spatially or temporally distant others.

Superficially, agent-centered prerogatives seem fair because they are granted to all agents equally. But there is real danger of injustice in their application. As an affluent American, I may use my agent-centered prerogative to consume unnecessarily at the expense of the poor and destitute, both now and in the future, who bear the brunt of the harms of climate change. Of course, they too have their agent-centered prerogatives. But, being reduced to destitution, they have little or no opportunity to take advantage of them. Allowing them greater moral license to attend to their interests does them little or no good. Thus an agent-centered prerogative may inequitably benefit the affluent. If,

²⁴ See Tim Mulgan, *Future People: A Moderate Consequentialist Account of Our Obligations to Future Generations* (Oxford: Oxford University Press 2008), § 4.1.

moreover, it permits me to continue my unnecessary emissions, which are harmful to others, I cannot see that it is morally defensible.

Wrong-Strategy Objection

Various authors (most notably Walter Sinnott-Armstrong)²⁵ have argued that the individuals' chief concern regarding climate change ought not to be with reducing their emissions, but rather with working politically to transform the fossil-fuel-powered economy in which we are all compelled to participate. I see no reason why we should not do both.

IV

Strategies for Relinquishment

Given that we ought to eliminate unnecessary uses of greenhouse gas producing devices, what is the best way to do so? Individuals lack the ability to render their emissions harmless by, say, ensuring their sequestration. Most also lack the ability to power their greenhouse-gas-producing devices by sustainable energy sources. In general, then, the quickest, cheapest and most practical way to eliminate unnecessary emissions is simply to stop using the devices that produce them.

Nonuse can be achieved in either of two ways. One is to retain the devices but refrain from using them unnecessarily. The efficacy of this strategy depends on the agent's resolve. Because the devices remain available, the temptation to use them may be

²⁵ W. Sinnott-Armstrong, "It's Not *My* Fault."

difficult to resist. Their non-use is apt to seem impertinent and absurd—especially since much of the harm of climate change is spatially and temporally distant.²⁶

The second option is to make the devices unavailable to ourselves—to get rid of them. To get rid of is *not* to sell or give away. That would not solve the problem. An SUV, a jet ski, or a hot tub, for example, would not lose its carbon footprint if acquired and used by someone else. The harm would continue. To get rid of them we must render them permanently inoperable—that is, destroy them. That, however, may not be psychologically easy. Hence this strategy may require even more resolve than nonuse, though over a shorter period of time. (If I could once muster the gumption to dismantle my hot tub, for example, it would take considerable effort and money to acquire a new one, which would likely be less tempting than using it while it remains operable on my back porch.)

Thus with both nonuse and destruction there are motivational difficulties. These vary, however, from person to person and from device to device. Those who can pursue one or the other of these strategies should do so. But, of course, not all will. The question then becomes: what practical ways are there to overcome the remaining motivational difficulties so as to enable the others more nearly to meet their obligations?

Fortunately, though somewhat ironically, there are slower, more passive, and hence psychologically easier means of

²⁶ This strategy has the additional, though perhaps minor, drawback that some devices have a carbon footprint even when not in use. Many electrical devices, for example, produce “ghost loads,” so long as they are plugged in to a live outlet. Thus even refraining from using such a device may not eliminate its carbon footprint. There is an easy remedy: unplug the device or switch off its power at a power strip when it is not in use. But even those who intend always to do so sometimes forget.

destruction. Contemporary manufacturing techniques insure that most devices self-destruct rather quickly; they wear out, break, or become obsolete. Thus instead of immediately destroying the device oneself, one might overcome the motivational difficulties by waiting until it self-destructs or becomes obsolete, and simply refraining from buying a new one. While slower than immediate destruction, this would in many cases produce emissions reductions much sooner and more certainly than waiting for the energy infrastructure to change.

There are other means of overcoming the motivational problems as well. Sometimes getting rid of a greenhouse-gas-emitting device (and perhaps fulfilling its function with a carbon-neutral technology) produces monetary savings. Replacing a car (perhaps a second car) with a bicycle, or a clothes dryer with a clothes line or rack, are good examples. For those with sufficient strength, using muscle power (as, for example, by biking rather than driving, or mowing with a push mower or scythe rather than a fossil-fuel-powered lawn mower)²⁷ may provide healthful exercise, without noise or air pollution. None of these ideas can work for everyone, of course, but it should be clear from these examples that the motivational problems are not in all cases fundamentally insuperable.

To summarize, individuals are morally obligated eliminate their unnecessary uses of greenhouse-gas-producing devices. There are main two ways to do this: to retain these devices but stop using them unnecessarily, or to get rid of them. Both present motivational difficulties, but these are not wholly insurmountable, and partial compliance is possible even for those who fail to meet their full obligations. Which of these two strategies is most

²⁷ In my experience (I have mowed exclusively by muscle-power for over twenty years), a good grass scythe is considerably more efficient than a push mower. See J. Nolt, *Down to Earth*, 43-6.

feasible for a given person and device will vary, but each can reduce our personal emissions more quickly and cheaply than just about anything else we could do.²⁸

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²⁸ Earlier versions of this paper were presented to the *Ethics, Energy and the Future* conference at Delft University of Technology, June 24-26, 2010, and to the *Appalachian Public Interest Environmental Law Conference*, University of Tennessee School of Law, November 19-21, 2010. I am grateful to Matt Deaton, Joel MacClellan, Annette Mendola, David Reidy, Clerk Shaw and the late Lee Shepski for helpful suggestions on early drafts. Two anonymous reviewers for this journal also contributed many useful comments.

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SYMPOSIUM
A CHANGING MORAL CLIMATE



CLIMATE SCEPTICISM, EPISTEMIC DISSONANCE,
AND THE ETHICS OF UNCERTAINTY

BY AXEL GELFERT

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Climate Scepticism, Epistemic Dissonance, and the Ethics of Uncertainty

Axel Gelfert

Abstract. When it comes to the public debate about the challenge of global climate change, moral questions are inextricably intertwined with epistemological ones. This manifests itself in at least two distinct ways. First, for a fixed set of epistemic standards, it may be irresponsible to delay policy-making until everyone agrees that such standards have been met. This has been extensively discussed in the literature on the precautionary principle. Second, key actors in the public debate may—for strategic reasons, or out of simple carelessness—engage in the selective variation of epistemic standards in response to evidence that would threaten to undermine their core beliefs, effectively leading to epistemic double standards that make rational agreement impossible. The latter scenario is aptly described as an instance of what Stephen Gardiner calls “epistemic corruption.” In the present paper, I aim to give an explanation of the cognitive basis of epistemic corruption and discuss its place within the moral landscape of the debate. In particular, I argue that epistemic corruption often reflects an agent’s attempt to reduce dissonance between incoming scientific evidence and the agent’s ideological core commitments. By selectively discounting the former, agents may attempt to preserve the coherence of the latter, yet in doing so they threaten to damage the integrity of evidence-based deliberation.

I

Introduction

For a problem that has been unfolding for many decades and has been receiving continuous media attention since at least the late 1980s, global warming was slow to catch the attention of academic philosophers. With the exception of a few isolated publications in the 1990s,¹ it was not until well into the 2000s that a more systematic philosophical discussion of the ethical, political and epistemological challenges of global climate change began to take shape. Over the past few years, however, this situation has changed markedly, and climate change has moved from being a topic at the margins of environmental ethics (and, to a lesser extent, the philosophy of science) to being a contested issue of global justice and an important touchstone for any theoretical attempt to square the demands of intergenerational responsibility with established frameworks of democratic theory and political philosophy.²

In the present paper, I argue that the moral dimension of climate change is inextricably intertwined with its epistemology, in at least two distinct ways. First, for a fixed set of epistemic standards, it may be irresponsible to delay policy-making until everyone agrees that such standards have been met. Second, key actors in the public debate may—deliberately or carelessly—engage in the selective variation of epistemic standards in

¹ E.g., D. Jamieson, “Ethics, Public Policy, and Global Warming,” *Science, Technology, and Human Values* 17 (1992), 139-153, and H. Coward and T. Hurka (eds.), *Ethics and Climate Change: The Greenhouse Effect* (Waterloo: Wilfrid Laurier University Press, 1993).

² See S. Gardiner, S. Caney, D. Jamieson and H. Shue (eds.), *Climate Ethics: Essential Readings* (New York: Oxford University Press, 2010), and D. Arnold (ed.), *The Ethics of Global Climate Change* (Cambridge: Cambridge University Press, 2011).

response to evidence that would threaten to undermine their core beliefs, effectively leading to epistemic double standards that make rational agreement impossible, or at least difficult, to achieve. Whereas the first point is essentially a version of the precautionary principle, which has received considerable philosophical attention, the second point is best described as an instance of what Stephen Gardiner calls ‘epistemic corruption.’ In the present paper, I aim to give a fuller account of the place of epistemic corruption within the debate about climate change as well as of its cognitive basis.

The rest of this paper is organized as follows. In Section 2, I give a brief survey of some of the moral issues in connection with climate change. In Section 3, I comment on the historical development and achievements of contemporary climate science as well as on the misconception that anthropogenic climate change has only recently become a topic of scientific discussion. Section 4 explores the recent notion of the ‘Anthropocene’ and how it relates to powerful self-images of the place of humans in nature. These play an important role in the cognitive mechanisms that drive epistemic corruption. As I argue in Section 5, agents may attempt to reduce any dissonance that may arise when scientific evidence challenges their ideological core commitments by selectively discounting such evidence so as to preserve their core commitments and sense of self. I develop this suggestion by drawing on the social-psychological literature on cognitive dissonance and, in Section 6, illustrate its application to the debate about climate change with a concrete historical example. Section 7 concludes with a discussion of the cognitive basis of epistemic corruption. By understanding epistemic corruption better, it may just be possible to lay the foundations for breaking the stalemate that characterizes current climate inaction.

II

Climate Change as a Moral Challenge

Humanity faces a plethora of challenges—poverty, inequality, armed conflicts, etc.—and one might think that global climate change should be considered simply one among a multiplicity of morally significant issues. Indeed, this has been a common theme among those critics who argue that international efforts at global cooperation should centre on specific achievable tasks—such as the alleviation of poverty, the eradication of diseases, international debt reduction etc.—rather than on the elusive goal of limiting carbon emissions on a global scale.³ Yet there are good reasons why the topic of climate change should occupy a special place in today’s political, moral, and philosophical landscape. For one, in spite of all the uncertainties that attach to specific predictions concerning the impact of climate change on individual communities and social-ecological systems, we know enough about its long-term effects to know that many of the more immediate problems—rising sea levels, disappearing glaciers and other freshwater reserves, disruptions of agriculture—will themselves be influenced, and typically exacerbated, by climate change. In addition, the problem of climate change also exhibits genuinely novel structural features that imbue it with a moral significance that cannot easily be reduced to the sum total of its adverse first-order effects that might result from a changing climate.

The structural novelty of climate change as a moral problem is two-fold. Whereas part of the novelty consists in the degree, or extent, to which climate change instantiates familiar ethical dilemmas, some of the new structural features relate directly to

³ For a typical example see B. Lomborg, *Cool It: The Skeptical Environmentalist’s Guide to Global Warming* (New York: Knopf, 2008).

the nature of the dynamic, causal and temporal processes involved. Regarding the former, consider the role of intention and agency in the evaluation of actions, such as the burning of fossil fuels, that contribute to climate change. Few people would claim that the current problem of global climate change is the result of anyone intentionally setting out to change the world's climate system. To be sure, there have been (and continue to be) attempts to control the weather and climate⁴, mostly at the local and regional level, and in recent years there has been a growing debate about the prospects of 'geo-engineering' as a *response* to climate change, but for the most part our current levels of climate change are the unintended consequence of actions performed for other reasons—which is not to say that agents are not often culpably negligent since lack of intention does not render entirely foreseeable consequences morally insignificant. By and large, the anthropogenic contribution to climate change is a side effect of rapid industrialization, population growth, and increasing levels of consumption and mobility. As a corollary, it is important to note that climate change “is caused not by a single agent, but by a vast number of individuals and institutions not unified by a comprehensive structure of agency.”⁵ At the level of individual emissions, the contribution to climate change of any one individual is virtually negligible—even when that individual engages in the most lavish 'high-carbon lifestyle' and consumption patterns.⁶ (The picture is somewhat different if one looks at institutions, which is why a number of climate activists

⁴ See J.R. Fleming, *Fixing the Sky: The Checkered History of Weather and Climate Control* (New York: Columbia University Press, 2010).

⁵ S.M. Gardiner, “A Perfect Moral Storm: Climate Change, Intergenerational Ethics and the Problem of Moral Corruption,” *Environmental Values* 15 (2006), 397-413, 399.

⁶ For the notion of “high carbon lives,” see J. Urry, *Climate Change and Society* (Cambridge: Polity, 2011), ch. 4.

have begun to single out, say, individual coal plants and their corporate owners.⁷) Yet, it is the (past and present) emissions of billions of individuals, predominantly from industrialized (or rapidly industrializing) countries, which collectively have set in motion the ongoing warming of the planet.

How the causally distributed nature of climate change obscures its moral significance can be seen by way of contrast with other widely discussed global challenges. Consider the example of global poverty. While no single individual's donation will be sufficient to bring world poverty to an end, even a small donation will make a measurable difference to the lives of specific others. Unfortunately, in the case of climate change, a similarly salient link between individual action and measurable beneficial effects is lacking. Even if I were to reduce my inflated first-world carbon footprint to levels at, or below, what is considered sustainable (ca. 2 metric tonnes per year), I could not reasonably expect this action alone to have any measurable mitigating effect with respect to the consequences of climate change, not least since the causal effects of any particular emission are impossible to trace. This means that, in turn, moral responsibility for the adverse effects of climate change is highly distributed. The novelty of climate change, considered as a *moral* problem, is thus partly due to the unprecedented degree of causal and geographical dispersion of what is essentially an unwelcome side effect of 'our' (first-world) lifestyles.

A second set of considerations arises from the fact that the dynamic, causal and temporal processes of climate change are not only causally and geographically dispersed, but also temporally extended. Many of the processes that are affected by increased greenhouse gas levels and that are, in turn, responsible for the

⁷ See C. Saunders and S. Price, "One Person's Eu-topia, Another's Hell: Climate Camp as a Heterotopia," *Environmental Politics* 18 (2009), 117-122.

potentially adverse consequences associated with climate change, operate on a time scale of decades or centuries—much longer than the time scales that are usually considered in moral evaluations of different actions. Thus, the average lifetime of carbon dioxide in the atmosphere has been estimated to be on the scale of decades (35-90 years),⁸ with a significant proportion of surplus carbon dioxide remaining in the atmosphere for millennia.⁹ Furthermore, it takes considerable time for the atmosphere to reach thermal equilibrium, once greenhouse gas concentrations have increased. Even if we were to cease emitting CO₂ entirely, thus stabilizing greenhouse gas levels at current levels, we could still expect future warming and the gradual unfolding of long-term processes (e.g. the melting of glaciers).

The above analysis has led some commentators to describe climate change as “a *substantially deferred* phenomenon.”¹⁰ This temporal deferral has a number of unwelcome consequences. For one, it leads to a further dissociation—in addition to the geographical and causal dispersion—between individual human actions and their adverse consequences on the climate, as well as between, on the one hand, our acknowledgment of climate change as a global problem and, on the other hand, our attributions of moral and political responsibility. Furthermore, because of the significant time delay between emissions and their long-term consequences, there remains the serious danger of our

⁸ See M.Z. Jacobson, “Correction to ‘Control of fossil-fuel particulate black carbon and organic matter, possibly the most effective method of slowing global warming,’” *Journal of Geophysical Research* 110 (2005), D14105, doi:10.1029/2005JD005888.

⁹ It is important to distinguish between the atmospheric lifetime of a *given* CO₂ molecule and the lifetime of surplus CO₂ concentrations, due to the existence of continuous exchange of molecules between the atmosphere, the oceans, and the biosphere.

¹⁰ S. Gardiner, *A Perfect Moral Storm*, 403.

inadvertently crossing systemic thresholds ('tipping points'), which could not easily be undone. In this case, inaction would breed irreversibility. The distributed nature of climate change and the very real possibility of radically altered long-term futures, details of which remain uncertain, are bound to create a state of anxiety, not least for anyone attached to the idea that our current lifestyles, civilizational structures, and population density should ideally be maintained in perpetuity.

The moral and political problem of climate change is as much an intergenerational problem as it is a problem for existing institutional frameworks of governance and global decision-making—partly because it brings into sharp focus the relative inadequacy of the latter in dealing with substantially deferred phenomena. Our moral practices and political mechanisms, which have been honed to deal with situations of (largely synchronic) conflict, governed by identifiable patterns of agency, cause and effect, seem to be woefully inadequate when it comes to the (diachronic) consequences of highly distributed human actions and their impact on processes that unfold at the time scale of biogeochemical cycles. It has even been argued that the structure of the moral and political problems posed by climate change, and of the various relations and trade-offs that exist between them, may be such that they effectively preclude collaborative good faith efforts to tackle climate change and its consequences. Stephen Gardiner has coined the phrase “perfect moral storm” to refer to just this aspect of what he calls “the ethical tragedy of climate change.” As Gardiner sees it, the confluence of the various aspects described so far—the truly global nature of the problem, the causal, geographical, and temporal dissociation between individual emissions and their long-term consequences, and the theoretical poverty of our moral and political frameworks—may conspire to create a motivational gap between the recognition of the problem and the (individual and

institutional) willingness to do something about it. One deep worry concerns the possibility that the very complexity of the problem “may turn out to be *perfectly convenient* for us, the current generation, and indeed for each successor generation as it comes to occupy our position”¹¹—insofar as it allows each generation to postpone meaningful (and ever costlier) climate action until the next generation. Such ‘intergenerational buck-passing’ is especially dangerous in cases, such as greenhouse gas emissions, where the effects of past missed opportunities accumulate. Effective action to prevent a global climate crisis, then, seems to require nothing short of a collective exercise of the moral imagination, on the part of the present generation as well as for generations to come. As Malcolm Bull puts it in a review of Gardiner’s book, climate ethics may not be “morality applied but morality discovered, a new chapter in the moral education of mankind.”¹²

III

Scientific Evidence and the Demands of Timeliness

In February 1965, U.S. President Lyndon B. Johnson, in a Special Message to Congress, urged lawmakers to keep in mind that “large-scale pollution of air and waterways is no respecter of political boundaries, and its effects extend far beyond those who cause it.” In particular, he noted:

¹¹ Ibid., 408.

¹² M. Bull, “What is the Rational Response?,” *London Review of Books* 34 (2012), 3-6, 6.

This generation has altered the composition of the atmosphere on a global scale through [...] a steady increase in carbon dioxide from the burning of fossil fuels.¹³

Johnson was reacting to the nascent scientific consensus, from the early 1960s onwards, that human industrial activity was leading to a gradual accumulation of carbon dioxide in the atmosphere. Since carbon dioxide had been known to be a greenhouse gas since at least the late nineteenth century, thanks to work of the Swedish chemical physicist Svante Arrhenius, increased levels of CO₂ in the atmosphere should be expected to bring about, in due course, a rise in average global temperatures. During the first half of the twentieth century, much of the interest in the connection between atmospheric CO₂ levels and the world's climate system was directed towards past climate change, in particular to understanding why there had been several ice ages throughout the Earth's history. Although Arrhenius had already estimated that a doubling of atmospheric CO₂ levels would lead to a 5-6°C rise in average global temperatures¹⁴, many scientists thought it unlikely that human emissions would reach such levels—not least because it was thought that the oceans, which contain about sixty times more carbon than the (pre-anthropogenic) atmosphere, would act as a near-perfect 'carbon sink,' dissolving—and thereby removing—surplus atmospheric carbon dioxide and 'trapping' it for centuries.¹⁵ It was not until a better understanding of surface ocean chemistry showed that

¹³ L.B. Johnson, "Special Message to the Congress on Conservation and Restoration of Natural Beauty," *Public Papers of the Presidents of the United States: Lyndon B. Johnson*, Vol. 1 (1965), (Washington, D. C.: Government Printing Office, 1966), 161.

¹⁴ See J. Uppenbrink, "Arrhenius and Global Warming," *Science*, 272 (1996), 1122.

¹⁵ See M. Maslin, *Global Warming: A Very Short Introduction* (Oxford: Oxford University Press, 2008). 25.

much of the absorbed carbon dioxide was immediately released again into the atmosphere¹⁶, and until more accurate direct measurements of atmospheric CO₂ levels were conducted from the late 1950s onwards—resulting in the famous ‘Keeling curve’ of measurements conducted on Mauna Loa in Hawaii, showing a steady year-on-year growth of atmospheric CO₂ levels, modulated by minor seasonal variations—that scientists realized that the permanent accumulation of anthropogenic CO₂ in the atmosphere was already well under way. It is such findings that President Johnson was referring to in his address to Congress. But not only policymakers, the educated public, too, were gradually being exposed to the emerging science of climate change. Thus, in 1956 Gilbert Plass published an article on “Carbon Dioxide and the Climate”¹⁷ in the general-audience journal *American Scientist*, in which he “explained in detail the sources and sinks for carbon dioxide in the atmosphere, and offered estimates of its influence on global average temperature and even ocean acidity.”¹⁸ Plass’s findings had previously been reported in the widely read magazine *Popular Mechanics* (1953) and were featured in a popular nation-wide radio programme *Excursions in Science* (1956), which was sponsored by General Electric and gave rise to spin-offs such as books and LP records.¹⁹

¹⁶ The classic paper is R. Revelle and H. Suess, “Carbon Dioxide Exchange Between Atmosphere and Ocean and the Question of an Increase of Atmospheric CO₂ during the Past Decades,” *Tellus* 9 (1957), 19-27.

¹⁷ G. Plass, “Carbon Dioxide and the Climate,” *American Scientist* 44 (1956), 302-316.

¹⁸ Quoted from the online introduction to a reprint of the article on the *American Scientist* website, <http://www.americanscientist.org/issues/page2/carbon-dioxide-and-the-climate> (accessed 31 January 2013).

¹⁹ Listeners to the programme were asked to write in to GE to request a transcript; G. N. Plass, “Scientific Paper No. 646,” *General Electric, Excursions in*

Over time, a more complete scientific picture emerged, both regarding the relative strength of different climate forcing factors—ruling out possible natural causes such as solar cycles and volcanoes as anything more than mere ‘modulations’ of underlying anthropogenic factors—and concerning the time scale at which different climate scenarios unfold. Thus, scientists realized that “glacial periods, or ice ages, take tens of thousand years to occur, primarily because ice sheets are very slow to build up and are naturally unstable,” whereas “the transition to a warmer period or interglacial, such as the present, is geologically very quick.”²⁰ By the time the Intergovernmental Panel on Climate Change (IPCC), formed in 1988 with the task of undertaking a comprehensive review of the scientific evidence in connection with climate change, presented its First Assessment Report in 1990, a scientific consensus had been reached that continued emissions of greenhouse gases due to the industrial and agricultural sector, combined with such factors as deforestation, would eventually give rise to irreversible effects, including significant sea level rises, changing patterns of precipitation, and changes in the distribution of extreme weather events. Scientific research in the 25 years since the founding of the IPCC has filled in more and more details, leading to a more subtle understanding of the world’s climate system and—thanks to improved computational models—resulting in more and more specific (and hence empirically testable) predictions, lending ever more support to the thesis that human activities are the dominant force driving current climate change.

Science Series. See also M. C. LaFollette, “A Survey of Science Content in U.S. Radio Broadcasting, 1920s through 1940s: Scientists Speak in Their Own Voices,” *Science Communication* 24 (2002), 4-33.

²⁰ M. Maslin, *Global Warming*, 29-30.

As this brief discussion shows, public pronouncements that anthropogenic climate change is a ‘new’ scientific phenomenon—‘invented,’ as it is sometimes claimed, by Al Gore in his 2006 movie *An Inconvenient Truth*—are deeply distorted. Scientific analyses of the potential warming effect of CO₂ accumulation in the atmosphere date back more than a century, and climate science as a systematic global effort can look back on decades of experience that have resulted in convergence upon a shared body of scientific evidence, methodologies and principles—and increasingly robust and reliable predictions of future states of the world’s climate system. Recognizing this scientific achievement is not to downplay the difficulties involved in studying a massively complex system like the world’s climate, especially when various ‘inputs’ to the system—such as anthropogenic greenhouse gas emissions—are themselves a ‘moving target’ that depends on complex social, economic and political choices. Thus, it has been argued that the traditional scientific goal of aiming for completeness in our models and computational representations of the global climate system may be misguided, insofar as what is called for—given the very real challenges posed by current climate change—is not complete empirical fidelity but a more pragmatic sense of ‘adequacy-for-purpose.’²¹ As is well-known from the literature on the epistemology of scientific models, for models of complex evolved systems, trade-offs between theoretical desiderata (e.g., accuracy, precision, generality and simplicity) may be inevitable.²² In such a situation, the goal of improving a model by adding more detail may be self-defeating. Furthermore, as Sandra Mitchell notes,

²¹ W. Parker, “Confirmation and Adequacy-for-Purpose in Climate Modelling,” *Proceedings of the Aristotelian Society (Suppl.)* 83 (2009), 233–249.

²² See A. Gelfert, “Strategies of Model-Building in Condensed Matter Physics: Trade-offs as a Demarcation Criterion Between Physics and Biology?,” *Synthese* 190 (2013), 253–272, and references therein.

in cases of complex systems, it may very well be that waiting until there is agreement or confidence in the quantitative probability assigned to possible outcomes is unreasonable. For example, we may be waiting until it is too late to avoid seriously undesirable consequences. [...] Alternative representations of what is known and what is not known, and alternative policy strategies that acknowledge ineliminable uncertainty, promise to provide a better guide to decision making.²³

An undue focus on the residual uncertainty of climate models and the inevitability, in general, of trade-offs in modelling, would, however, not only violate the demands of timeliness that come with researching policy-relevant phenomena, but would also risk downplaying the actual explanatory and predictive successes that climate science has amassed over the past decades.²⁴ Climate science today works with models that “simulate an ever-increasing range of processes and feedbacks and are tested in a wide range of applications and for different climate states.”²⁵ As Elizabeth Lloyd notes, “today’s climate models are supported empirically in several ways that receive little explicit attention”²⁶—including the fact that they are based on proven causal mechanisms, display significant convergence and robustness, and receive empirical confirmation from multiple independent sources of evidence. Perhaps most significantly, “no credible model has been produced that questions the strong

²³ S. Mitchell, *Unsimple Truths: Science, Complexity, and Policy* (Chicago: University of Chicago Press, 2009), 89.

²⁴ A good example is the prediction of Arctic methane release due to warming temperatures, which was predicted in the early 1990s and was subsequently reported in 2008. N. Shakhova, I. Semiletov, A. Salyuk, D. Kosmach and N. Bel’cheva, “Methane Release on the Arctic East Siberian Shelf,” *Geophysical Research Abstracts* 9 (2007), 01071.

²⁵ R. Knutti, “Should We Believe Model Predictions of Future Climate Change?,” *Philosophical Transactions of the Royal Society A* 366 (2008), 4657.

²⁶ E. Lloyd, “Varieties of Support and Confirmation of Climate Models,” *Proceedings of the Aristotelian Society (Suppl.)* 83 (2009), 228.

anthropogenic influence on climate in the past and future.”²⁷ All models, as a matter of practical necessity, involve simplification, abstraction, and idealization, since their function is to enable inquiry into systems that are too complex to describe in every detail. For this reason, one must take special care not to apply epistemic double standards, as might happen if one demands the highest standards of proof for climate models, while accepting far lower standards of evidence for, say, economic models of the cost of combating climate change. (For an instance of such epistemic double standards, see the case study in Section 6.) If anything, the observation that today’s climate models are known to have room for improvement is an indicator of the fact that they are based on known causal mechanisms—which is more than can be said of many models in, say, the social sciences (including economics).

IV

Human Self-Images in the Anthropocene

In the year 2000, Nobel laureate Paul Crutzen and his co-author Eugene Stoermer introduced the term ‘Anthropocene’ to emphasize the fact that humans had driven Earth into a new geological epoch, one in which virtually every aspect of the planet’s biogeochemistry showed signs of human activity or, as in the case of the global climate system, was subject to substantial anthropogenic forcings.²⁸ Many of the facts that have been cited as motivating the term ‘Anthropocene’ are indeed stark. Carbon dioxide concentrations “are already 30–40% higher than ever

²⁷ Ibid.

²⁸ P. Crutzen and E. Stoermer, “The ‘Anthropocene,’” *IGBP Newsletter* 429 (2000), 623–628.

experienced during the past 650,000 years.”²⁹ Humans are thought to have become the “premier geomorphic agent sculpting the landscape.”³⁰ More nitrogen in the form of artificial fertilizer “is applied in agriculture than is fixed naturally in all terrestrial ecosystems.”³¹ Add to this the rapid extinction of non-human species through hunting, habitat loss, and agriculture, along with other anthropogenic markers, and the planetary scale of human influence on the Earth’s biogeochemical systems becomes evident. When viewed from this angle, the meaning of ‘Anthropocene’ is as much a matter of the biogeochemistry of the planet as it is a recognition of the special historical moment that we, as a species, find ourselves in. The question of whether or not we live in the ‘Anthropocene’ thus becomes, at least in part, a matter of reassessing the place of humans in nature. This latter project has a recognizably normative-philosophical dimension—for the question of ‘Man’s place in nature’ has always been closely associated with the question of how we ought to conduct ourselves in relation to our environment. What is at stake, then, is not only the future state of the planet, but our self-image as human beings living on this planet. Once it is realized that living in the Anthropocene is not merely a matter of ‘managing’ the ongoing physical, biogeochemical, and ecological changes around us, but that it also requires a decision on what we see as our proper place in this complex process of adaptation and management, it becomes clear that there is ample potential for conflicting moral visions.

²⁹ P. Crutzen, “Albedo Enhancement by Stratospheric Sulfur Injections: A Contribution to Resolve a Policy Dilemma?,” *Climatic Change* 77 (2006), 221-220, 215.

³⁰ R. Hooke, “On the History of Humans as Geomorphic Agents,” *Geology* 28 (2000), 843-846.

³¹ P. Crutzen, *Geology of Mankind* (2002), 23.

Earlier (see Section 2), it was noted that the problem of climate change required nothing short of a collective exercise of the moral imagination. The precise form such an exercise in moral imagination will take, however, is not uniquely determined by the scientific facts alone; rather, it depends on value judgments and prior commitments to views concerning the place of humans in nature. In the remainder of this section, I shall focus on two such (classes of) human self-images in the Anthropocene, and will attempt to lay out how commitments to competing moral visions can influence the perception, interpretation and evaluation of the overall situation, as portrayed by science. In particular, as we shall see shortly, deep commitments to such visions can significantly shape epistemological stances towards standards of evidence and balancing conflicting beliefs. There is, of course, a continuum of possible outlooks, ranging from the Christian notion that humans should be ‘stewards’ of the Earth to its Baconian reinterpretation as giving humans licence to dominate and exploit nature. In what follows, I shall focus on two sharply contrasting outlooks which, although not widely advocated in their ‘purest’ form, nonetheless have enjoyed some currency in the public debate. For lack of a better terminology, I shall refer to the two views as the ‘cornucopian’ and the ‘limits-to-growth’ views, respectively.

Cornucopians hold that, for all practical intents and purposes, the resources of the Earth can be considered limitless. As the economist Julian Simon puts it:

There is no reason to believe that at any given moment in the future the available quantity of any natural resource or service at present prices will be much smaller than it is now, or non-existent.³²

³² J. Simon, *The Ultimate Resource* (Princeton: Princeton University Press, 1981), 48.

Emboldened by the failure of Malthusian predictions, according to which rapid population growth would quickly deplete scarce resources, cornucopians argue that, on the contrary, population growth offers a solution to resource scarcities and environmental problems, as this would unleash human ingenuity and the innovative power of markets. Even if certain resources are indeed physically scarce, such scarcities can be overcome through market-based innovation, as resource use becomes more efficient and substitutes are being developed. “The main fuel to speed the world’s progress is the stock of human knowledge,”³³ allowing humanity “to go increasing forever.”³⁴ As Sarah Krakoff has noted, this take on the place of humans in nature is premised on a somewhat idiosyncratic “ontology of the planet,” which views the Earth as “an endlessly malleable resource, which when we apply our dazzling ingenuity to it, can yield ever increasing wealth for humans.”³⁵ It is also based on a distinctive view of human beings, who are characterized as “the ultimate resource”—“skilled, spirited, hopeful people, exerting their wills and imaginations to provide for themselves and their families, thereby inevitably contributing to the benefit of everyone.”³⁶ Whereas the ‘cornucopian’ label might initially suggest that human beings are seen as passive consumers of whatever the Earth’s ‘horn of plenty’ has to offer, it is really human beings who, on this view, are being credited with near-magical productive powers.

³³ N. Myers and J. Simon, *Scarcity or Abundance? A Debate on the Environment* (New York: Norton, 1994), 33.

³⁴ *Ibid.*, 65.

³⁵ Sarah Krakoff, *Parenting the Planet*, in D.G. Arnold (ed.), *The Ethics of Global Climate Change* (Cambridge: Cambridge University Press, 2011), 165.

³⁶ Myers and Simon, *Scarcity or Abundance?*, 33.

At the other end of the spectrum from cornucopianism is what I shall call the ‘limits-to-growth’ view.³⁷ On this view, while humanity has made great strides, not least through science and technology, in creating systems of production and supply that so far have been able not only to support an ever-increasing population, but to also lift a larger and larger percentage of people out of poverty, the fact remains that resources are finite and that no amount of human ingenuity can transcend the very real physical and ecological limits of what the planet can support. If past predictions—ranging from Malthusian food shortages to worries about ‘peak oil’—have turned out to be wrong, then this is because the upper limits of productive capacity have been underestimated, not because no such limits exist. Thinking of the ‘limits to growth’ purely in terms of impending shortages in the supply of raw materials may also be too simplistic. Indeed, in the case of climate change, it is the overabundance of fossil fuels which poses a major challenge to any attempts to rein in anthropogenic greenhouse gas emissions. After all, it is estimated that the amount of carbon contained in proven oil, gas and coal reserves of the main fossil fuel producers exceeds the amount that can be ‘safely’ tolerated by the atmosphere—that is, without leading to run-away climate change beyond the 2°C limit—by around a factor of five.³⁸ A narrow focus on the alleged substitutability of scarce resources thus misses the important point that some of the limits of growth are *systemic* in nature. As one ‘limits-to-growth’ critic of the cornucopian view puts it:

³⁷ I prefer this to the usual label ‘neo-Malthusian’ which has rather specific historical connotations.

³⁸ For a popular discussion of this point see Bill McKibben, *Global Warming’s Terrifying New Math*, “The Rolling Stone” (19 July 2012), online at <http://www.rollingstone.com/politics/news/global-warmings-terrifying-new-math-20120719> (accessed 31 January 2013).

There are many, including myself, who believe that given a reasonably free market, technology can generally be depended upon to find a substitute for almost any scarce material resource input (except energy itself). However, there are no plausible technological substitutes for climatic stability, stratospheric ozone, air, water, topsoil, vegetation—especially forest—or species diversity.³⁹

Consonant with this view of the Earth as “a bounded system with resources that are by definition limited,”⁴⁰ is a view of human beings that emphasizes the contingency and fragility of our own existence, as well as that of the Earth system at large, along with the need to care for the latter. If the proper exercise of care requires that we forego, say, short-term economic benefit in exchange for a better chance at long-term sustainability, then, on this world view, it will not be irrational to do so. Indeed, it may be the very course of action that is called for, given the circumstances.

What is of central importance to the present argument is the realization that views concerning the ontology of the Earth system and the place of humans in nature are not ideologically neutral, but are often aligned with—or, indeed, are expressions of—certain moral and political values. Thus, if one subscribes to the ‘limits-to-growth’ view, according to which natural resources—and, consequently, the amount of wealth that can be generated from them—are necessarily finite, it may seem natural to also worry about the unequal distribution of such wealth. Similarly, if human ingenuity and individual enterprise are seen as a panacea for all of mankind’s problems, then any restrictions on the free exercise of these faculties—for example, in the form of

³⁹ R.U. Ayres, “Cowboys, Cornucopians and Long-Run Sustainability,” *Ecological Economics* 8 (1993), 189-207, 195.

⁴⁰ S. Krakoff, *Parenting the Planet*, 165.

government-imposed restrictions on the flow or accumulation of capital—would likely be considered loathsome.⁴¹

Finally, it has been suggested—usually by adherents of the opposing view—that both ‘cornucopianism’ and the ‘limits-to-growth’ view are more indicative of a general psychological disposition than they are labels of coherent ideological positions. Hence, adherents of the ‘limits-of-growth’ view are sometimes labelled ‘technological pessimists’ or ‘doomsters,’ whereas advocates of cornucopianism have been said to be prone to ‘foolish optimism’⁴² and an immature, anthropocentric ‘techno-narcissism.’ While it may be tempting to regard the exchange of such epithets as a merely polemical device, it is important to realize that such labels do pick up on very real psychosocial differences between the opposing camps—differences which, as I shall argue in the rest of this paper, give rise to curious epistemic strategies when it comes to assessing the actual situation we find ourselves in and the demands it places on us.

⁴¹ There is, of course, no *necessary* connection between endorsing a certain vision of humans’ place in nature and supporting specific political proposals or policies. As the 20th-century example of the Soviet Union shows, belief in the limitless powers of technology is as compatible with political authoritarianism as laissez-faire Social Darwinism is with belief in the need to compete for limited resources. Even within the ranks of American technological optimists, some authors have distinguished between those who ‘see government as an active, interventionist ally (e.g., the “cavalry”’) in taming and exploiting the wilderness’ (the ‘cowboys’) and those who ‘see the role of central government as limited to macro-economic policy and defense’ (the ‘cornucopians’ in a narrow sense). See R.U. Ayres, *Cowboys*, 194.

⁴² Jonathan Power, “The Cornucopians’ Foolish Optimism,” *The Baltimore Sun* (17 April 1992), 9.

V

Cognitive Dissonance and Epistemic Standards

In the previous section I argued that differences in ideological outlook—which manifest themselves in divergent views regarding the place of humans in nature—colour the perception of global problems such as climate change, either by reconceptualizing them as technical problems that need to be overcome by human ingenuity and technological innovation (as in the case of cornucopianism) or by treating them as signs of an imminent violation of objective system constraints (as in the case of the ‘limits-to-growth’ view) requiring a significant reduction of our ‘footprint’ on the system, so as to maintain its balance. In this section, I shall illustrate how such ‘colouring’ of perception may arise in practice, suggest a psychological mechanism for it, and argue that it may have unwelcome epistemic consequences—which in turn give rise to moral worries about the corruption of scientific due process and the harmful consequences that may result.

First, however, it is important to address a worry that might be raised for any attempt at generalizing about patterns of belief formation in controversial matters. Given that, as outlined in Section 2, the moral and political choices are stark, and the underlying processes complicated, is it not entirely to be expected that there should be considerable variation in the responses to a complex challenge of global proportion? And won’t there always be considerable diversity in the response of individuals, due to differences in outlook, background knowledge, and other idiosyncratic factors? The answer to both questions is, of course, yes. But the primary goal is not to evaluate *individual* beliefs, considered in isolation, but to analyze how such belief formation may be systematically influenced by ideological attitudes and commitments. Furthermore, it is worth keeping in mind that,

certainly with respect to its factual basis, global climate change is not simply a matter of individual opinion. While there is much scientific disagreement about details and considerable uncertainty attaching to specific predictions, the reasons for the persistence of, say, mismatches between different climate models are themselves the subject of scientific investigation. Such investigation takes place against the backdrop of an overwhelming scientific consensus about the basic mechanisms driving current climate change.⁴³ Given the high profile of climate change as a global issue and the media attention it has enjoyed over the past 25 years, virtually every commentator on the topic—even those who proclaim themselves to be ‘sceptics’—will likely be familiar with the scientific consensus, at least in its most basic outline. Indeed, as I shall argue, familiarity with the consensus view—where that view is in tension with an individual’s basic ideological outlook—may itself explain some of the more peculiar epistemic and argumentative strategies in the public debate. When the authority of the scientific consensus—directly or indirectly—challenges beliefs (or meta-beliefs, e.g. about what constitutes compelling reasons for action) that are central to an agent’s self-image, an agent may resort to selectively discounting such evidence so as to preserve the coherence of his core beliefs and avoid dissonance.

Social psychology has investigated the basis of such phenomena under the label of ‘cognitive dissonance theory’ since the mid-1950s. According to its original formulation due to Leon Festinger (1957), an unpleasant state of ‘dissonance’ arises whenever an agent holds two cognitions that are relevant to each

⁴³ N. Oreskes, “The Scientific Consensus on Climate Change,” *Science* 306 (2004), 1686.

other but contradict one another.⁴⁴ Like basic drive states such as hunger or thirst, the unpleasant state of dissonance, too, can motivate agents, typically in such a way that agents

may engage in ‘psychological work’ to reduce the inconsistency. This work will typically be oriented around supporting the cognition most resistant to change. To reduce the dissonance, individuals could add consonant cognitions, subtract dissonant cognitions, increase the importance of consonant cognitions, or decrease the importance of dissonant cognitions.⁴⁵

One important measure of dissonance reduction is change in attitudes. Such change, according to dissonance theory, “is expected to be in the direction of the cognition that is most resistant to change.”⁴⁶ Although cognitive in its orientation, many of the most prominent applications of dissonance theory relate directly to behaviour, including social behaviour. This has led to a number of theoretical refinements, such as the differentiation of the (unitary) notion of dissonance into the concepts of dissonance arousal and dissonance motivation⁴⁷, and to ‘action-based’ models, according to which dissonance reduction not only serves the proximal goal of reducing the unpleasant state of dissonance arousal, but also the distal function of “facilitating the execution of effective and unconflicted action.”⁴⁸

Among the plethora of theoretical extensions and experimental findings, a number of results are especially

⁴⁴ L. Festinger, *A Theory of Cognitive Dissonance* (Evanston: Row and Peterson, 1957).

⁴⁵ E. Harmon-Jones, “Cognitive Dissonance Theory,” in V.S. Ramachandran (ed.), *The Encyclopedia of Human Behavior*, Vol. 1 (New York: Academic Press, 2012), 544.

⁴⁶ *Ibid.*

⁴⁷ J. Cooper and R. Fazio, “A New Look at Dissonance Theory,” *Advances in Experimental Social Psychology* 17 (1984), 229-266.

⁴⁸ E. Harmon-Jones, *Cognitive Dissonance Theory*, 546.

insightful. Thus, in a number of experiments it was shown that when participants had to make a difficult choice—between two mutually exclusive, but similarly attractive—alternatives, their attitude towards the rejected alternative was more negative after they had made their choice than immediately before. That is, after having made an irreversible decision, participants would discard all those (dissonant) cognitions that, prior to the choice, would have favoured the rejected alternative. Similarly, in the case of ‘adaptive preference formation’⁴⁹, if an agent desires something, but finds it unattainable, the dissonance that results from the mismatch between what is desirable and what is feasible is reduced by discounting the initial attractiveness. Finally, in a famous experiment studying conditions of induced compliance, participants were recruited to perform a boring task in the laboratory.⁵⁰ The same participants subsequently were paid either a trivial amount (\$1) or a significant amount (\$20) to ‘lie to’ another participant by telling them that the task they would be performing was, in fact, interesting. Whereas the \$20 payment was expected to provide sufficient justification for the counter-attitudinal behaviour, the \$1 payment, by contrast, was thought to be insufficient to offset the dissonance created by lying to another participant. And indeed, in response to the \$1 condition, participants reduced their dissonance by revising upwards their initial judgments concerning the interestingness of the task.

Given the wide range of contexts across which dissonance-related phenomena have been observed, one should expect attempts at dissonance reduction to also play a role in activities pertaining to public debate—such as questioning, disputing,

⁴⁹ See J. Elster, *Sour Grapes: Studies in the Subversion of Rationality*, (Cambridge: Cambridge University Press, 1983).

⁵⁰ L. Festinger and J.M. Carlsmith, “Cognitive Consequences of Forced Compliance,” *Journal of Abnormal and Social Psychology* 58 (1959), 203-210.

rebutting, denying etc. All of these are as much actions as they are expressions of attitudes and beliefs and, especially when performed in a public setting, may be both the source of dissonance and ways of managing perceived dissonance. However, unlike in situations with determinate outcomes—which, plausibly, are the norm in standard experimental setups—participation in real-life public debate is typically open-ended, especially when the debate is about complex long-term challenges. Rather than moderate their attitudes in an adaptive way—either by ‘rationalizing’ their past choices or by reassessing the perceived consequences of such choices—participants may engage in more elaborate forms of ‘reputation management,’ or may even bolster their initial attitudes in the face of evidence that challenges their central commitments. Experimental research provides evidence for such attitude bolstering. In a study by Sherman and Gorkin⁵¹, subjects who scored high on a feminism scale and failed to solve a difficult logic problem concerning gender roles—thereby ‘demonstrating’ their own sexist thinking—subsequently displayed attitude bolstering in the form of positive affirmative action decisions: When an opportunity arose to reaffirm their central attitudes, e.g. by subsequently participating in affirmative action deliberations involving a female candidate, the subjects with the highest scores of feminism among those who had failed the sex-role test ‘overcompensated’ their earlier failure by being more favourable towards the female candidate than (equally feminist) control subjects. Attitude moderation may also be precluded by a tendency to misattribute dissonance arousal to extraneous factors that are not, in fact, responsible for the cognitive discomfort experienced. In cases where the dissonance is self-generated, or is due to a mismatch

⁵¹ S.J. Sherman and L. Gorkin, “Attitude Bolstering when Behavior is Inconsistent with Central Attitudes,” *Journal of Experimental Social Psychology* 16 (1980), 388-403.

between an agent's central attitudes and the world, this may open up avenues for an agent to protect his sense of self by blaming dissonance on objectively irrelevant factors. That is, agents 'may reassess the events that led them to experience dissonance motivation in a distorted fashion, or they may acknowledge their transgression and strive to make amends'⁵², for example by seeking out opportunities to reinforce their fundamental outlook.

What are conceivable sources of cognitive dissonance in the debate about global warming? A number of factors immediately spring to mind. First, incoming scientific evidence might put pressure on deeply held ideological commitments, such as the cornucopian conviction that the Earth's resources are essentially limitless and are able to support perpetual economic (and population) growth. The point, here, is not that science directly adjudicates between different goals that trade off against each other—say, economic growth and preserving natural resources—but rather that it spells out the constraints under which such trade-offs necessarily have to take place. Science does not tell us that continued burning of fossil fuels, or the exploitation of hitherto untapped energy sources such as tar sands or shale gas, are *wrong*, but that these activities come at the price of irreversible climate change, with all its attendant consequences: rising sea levels that will permanently flood coastal communities, shifts in the distribution of extreme weather events, changed patterns of precipitation etc. Hence, if an individual's cornucopian belief in perpetual innovation and continued economic growth is based on the hope that the future, although wealthier and technologically more advanced, will nonetheless be largely continuous with the world as we know it—that is, there will be no major disruptions or catastrophic changes—then the dire predictions of climate science for such business-as-usual scenarios will inject a

⁵² J. Cooper and R. Fazio, "A New Look at Dissonance Theory," 259.

significant amount of cognitive dissonance into the individual's belief system. If one's commitment to the cornucopian dogma, with its promise of a bright, limitless future, is so central to one's sense of self that one could not very well give it up, one would plausibly look for ways of discounting the dissonant scientific information as 'uncertain,' 'implausible,' or perhaps even 'alarmist.'

One common strategy of avoiding dissonance while maintaining the coherence of one's central attitudes, I submit, is the selective variation of epistemic standards. Especially in the context of the public debate of complex questions, where appropriate levels of uncertainty and reliability are not obvious and typically cannot be assessed by a single individual, agents may be tempted to vary their judgments of the reliability (and of its sufficiency for knowledge) of a given piece of information in accordance with the 'overall fit' of the information with the agent's central attitudes and commitments. On this model, one would expect incoming information that fits with an agent's ideological outlook to be perceived as more reliable than information that does not fit, or even contradicts, that outlook. Historical evidence of the controversy about climate change suggests that this mechanism is precisely what has been driving some of the more prominent cases of 'climate scepticism.' In the remainder of this section, I shall draw on recent historical work that analyzes the origins and strategies behind efforts to discredit the scientific consensus that has been consolidating for at least the past two decades. At the same time, I shall look at exemplary cases of how, on my interpretation, dissonance may drive the selective revision of epistemic standards, understood both in terms of the perceived reliability of information and in terms of its perceived sufficiency for knowledge and action. I should emphasize that my analysis is not intended as a substitute for empirical research into the social psychology of public

controversies, but instead aims at highlighting the relevance of such research to philosophical questions at the intersection of epistemology and ethics.

Naomi Oreskes and Eric Conway, in their book *Merchants of Doubt* (2010), have shown, as the subtitle of their study puts it, ‘How a Handful of Scientists Obscured the Truth on Issues from Tobacco Smoke to Global Warming.’ And it is indeed striking that a number of scientists who came to prominence as self-professed ‘climate sceptics’ from the 1990s onwards, and who continue to be cited as authority figures by journalists and lobby groups associated with the climate-sceptic movement, had previously been involved in efforts by the tobacco industry to perpetuate scientific doubts about the link between smoking and lung cancer, as well as in other controversies in which scientific evidence—such as findings that acid rain was caused by industrial emissions, and that CFCs were responsible for ozone depletion in the stratosphere—had given rise to a nascent political consensus that some degree of regulation was called for.⁵³ It is easy to see how the threat of government intervention might prompt those with a strong ideological attachment to free market principles to find fault with whatever facts are presented as justifying government involvement. What is perhaps less obvious is the fact, also documented by Oreskes and Conway, that a number of the most prominent ‘first-generation’ climate sceptics—including Frederick Seitz, Robert Jastrow, William Nierenberg and others—shared fierce anti-Communist views which, at various points, had led to their falling out with the majority of their colleagues, for example over the technical feasibility and political desirability of President Reagan’s Strategic Defense Initiative (SDI), which

⁵³ See N. Oreskes and E. Conway, *Merchants of Doubt* (New York: Bloomsbury 2010), esp. ch. 2.

proposed installing a system of high power lasers in space that could destroy incoming Soviet missiles.⁵⁴

The existence of strong ideological commitments in the form of a fierce anti-Communism, combined with a shared self-image as hard-nosed ‘realists’ (about the Soviet threat), and a sense of ‘being the underdog’ in relation to the—politically more liberal—scientific establishment, made for a potent combination of psychosocial factors, which would exert pressure on members of the group to resolve any dissonance between incoming scientific information and ideological commitments in favour of the latter. If the reaction to incoming information is partly determined by deeply held prior commitments of a personal or ideological sort, then it is to be expected that, in any real-life setting, close attention must be paid to the specific combination of outlooks and opinions of a given agent. Whereas in experimental studies of the basic mechanism of cognitive dissonance, it may be possible to prepare experimental subjects in such a way as to achieve sufficient homogeneity to allow for generalizations, in the more complex case of real-life public controversies, it may be more fruitful to look at existing social groups (such as the climate-sceptic movement) or individual case studies.

The selective shifting of epistemic standards as a way of reducing dissonance should be expected to occur whenever strong commitments are challenged by evidence that allows for some degree of ‘deniability,’ as it were. Personal experiences and

⁵⁴ Myanna Lahsen notes the shared ‘normative frameworks’ between Seitz, Jastrow, and Nierenberg, but adds another layer of interpretation by explaining their behaviour as ‘a reaction to a loss in privilege and a general decline of physics,’ given that all three obtained their doctorates in physics at East Coast universities in the 1930s and 1940s. See M. Lahsen, “Experiences of Modernity in the Greenhouse: A Cultural Analysis of a Physicist ‘Trio’ Supporting the Backlash Against Global Warming,” *Global Environmental Change* 18 (2007), 204–219, esp. 209.

emotional investments are often protected against the challenges emerging from—objectively more justified, but subjectively less salient—scientific evidence. This phenomenon is not limited to ideological commitments of a particular political persuasion. A politically ‘neutral’ example would be the case of the so-called ‘MMR vaccine controversy’ in the UK in the late 1990s, when fraudulent research by a single medical doctor challenged the consensus view that MMR vaccinations are safe, prompting many parents not to vaccinate their children—thereby placing them at risk of contracting crippling diseases and, furthermore, endangering herd immunity. A plausible case may be made that many of those parents did not strongly believe in the fraudulent claim that MMR vaccinations cause autism, but nonetheless shifted their epistemic standards in such a way as to rationalize their decision to opt out—effectively aiming to free-ride on the public vaccination system, by letting their children enjoy the benefits of (everyone else’s) herd immunity, without incurring the (hypothetical, but not logically impossible) risk of side effects that every vaccination incurs. Parents, thus, may have believed both ‘that the evidence in favour of the claim that the triple vaccine is safe meets the epistemic standards appropriate in science’ and, at the same time, that ‘those standards, although very high, are lower than the standards [*they*] should adopt for accepting that the vaccine is safe.’⁵⁵ While for some parents the decision not to vaccinate their children may have been a rational (though irresponsibly selfish) choice to ‘free-ride’ on the system, this would not explain why concerns about MMR vaccines have outlived the—widely publicized—debunking of the MMR-autism link as fraudulent. A more plausible interpretation is that, when faced with the tasks of balancing their deep emotional commitment to the total safety of their child against the scientific

⁵⁵ S. John, “Expert Testimony and Epistemological Free-riding: The MMR Controversy,” *The Philosophical Quarterly* 61 (2011), 496-517; here 507-508.

evidence that vaccinations carry only a negligible risk, some parents adjust their standards so as to dismiss even the best scientific evidence, if it allows them to leave their emotional commitments untouched.

VI

From Cold War Alarmism to Climate Change Scepticism: The Case of Edward Teller

An interesting case for the purpose of this paper is that of Edward Teller. Although not as ardent a climate ‘sceptic’ as the historical figures discussed by Oreskes and Conway, Teller was part of the same league of fervent anti-Communists who worked together to steer American foreign and defence policy towards a more hawkish stance on confronting the Soviet Union. As such, they opposed efforts to effect a *détente* between the two superpowers, which had been gaining some support under President Ford. In particular, they accused the official intelligence agencies’ reports, which collated the various sources of evidence that had been gathered by intelligence experts in the field, of dramatically underestimating the threat posed by the Soviet Union. Intense lobbying to have the expert data re-analyzed ‘independently’—that is, by hawkish ‘outsiders’—led to the formation of what came to be known as ‘Team B.’ One bone of contention was the Soviets’ ability, or lack thereof, to locate American submarines using non-acoustic means. The CIA’s 1975 National Intelligence Estimate stated that the Soviets ‘currently do not have an effective defense against the U.S. submarine

force⁵⁶, yet Team B, with input from its appointed reviewers, including Teller, concluded that the absence of such defences posed a puzzle. ‘The absence of a deployed system by this time,’ the panel found, ‘is difficult to understand’ and might mean ‘that the Soviets have, in fact, deployed some operational non-acoustic systems and will deploy more in the next few years.’⁵⁷ The absence of evidence for the existence of non-acoustic systems for locating U.S. submarines was thus not only taken to be compatible with the claim that such system might exist regardless, but was reinterpreted as evidence that such systems were so technologically advanced that, in spite of their already being operational, they had successfully eluded detection. Decades earlier, Teller’s strategy of promoting ‘a bald statement of the worst-case scenario’⁵⁸ for which the United States had to prepare, had already surfaced, in 1949, when Teller, as his Los Alamos colleague George Cowan recounts,

started putting out memos to the effect that the Russian bomb was probably made using plutonium made in a heavy water reactor. [...] And so he took a worst case scenario immediately which was that the Russians very possibly, and even very likely, would have the capability [...] to beat us to a thermonuclear weapon. So he created an enormous sense of urgency.⁵⁹

When it came to a perceived Communist threat, the smallest shred of evidence—and sometimes even the lack of evidence altogether—apparently sufficed to warrant substantive political action. Mere possibility, through a selective adjustment of

⁵⁶ National Intelligence Estimate 1975, quoted after N. Oreskes and E. Conway, *Merchants of Doubt*, 39.

⁵⁷ Report of ‘Team B,’ quoted after N. Oreskes and E. Conway, *Merchants of Doubt*, 41.

⁵⁸ *Ibid.*, 39.

⁵⁹ Quoted in P. Goodchild, *Edward Teller: The Real Dr. Strangelove* (Cambridge (MA): Harvard University Press, 2004), 145.

epistemic standards, was magically transformed into near certainty, which in turn resonated with deeply held beliefs about the nefarious intentions of the Soviet enemy.

This episode might seem to be little more than an illustration of Cold War paranoia, if it did not make for a sharp contrast with Teller's attitude towards climate change, where he applied very different epistemic standards. As mentioned earlier, Teller—unlike a number of hawkish Cold War scientists—never became centrally involved in efforts to portray 'global warming alarmism' as a new threat to freedom. He did, however, comment publicly on the topic, playing down the threat posed by global warming and arguing for technical solutions instead of, say, emissions cuts that would entail having to restructure the world's energy economy. Whereas in the Cold War context of a potential Soviet threat, Teller argued for an extreme version of the precautionary principle—that action should be guided by 'worst-case scenarios,' even in the absence of hard evidence—in the case of climate change, as we shall see, he forcefully promoted a 'wait-and-see' approach, even at a time when a scientific consensus had already begun to form. Given that four or more decades lie between the two episodes, one might think that Teller simply changed his mind on how much evidence was required to warrant costly policy decisions. Applying different epistemic standards in each case, on this interpretation, might simply be the result of having learnt from past experience, rather than of dissonance-induced 'double standards.' However, this charitable interpretation falls flat, insofar as Teller steadfastly defended his Cold War assessments until his death in 2003⁶⁰; furthermore, it overlooks that selective adjustment of epistemic standards, so as to cohere

⁶⁰ See, for example, G. Stix, "Infamy and Honor at the Atomic Café," *Scientific American* 281 (1999), 42-43.

with deep ideological commitments, can also be found *within* his later pronouncements on climate change.

In a 1997 op-ed piece for the *Wall Street Journal*, Teller argued for research and investment into geoengineering—that is, deliberate interventions in the Earth’s energy balance, by increasing the planet’s albedo, keeping sunlight from reaching the Earth (e.g. via a massive fleet of space-based solar shields), or ‘fertilizing’ the oceans so as to increase algae growth, thereby removing CO₂ from the atmosphere—while at the same time downplaying the scientific evidence for anthropogenic climate change in the first place. Thus, Teller writes: ‘Society’s emissions of carbon dioxide may or may not turn out to have something significant to do with global warming—the jury is still out.’⁶¹ Adopting the dual rhetorical devices of neutrality and personal gravitas, Teller immediately reaffirms his claim: ‘As a scientist, I must stand silent on this issue until it’s resolved scientifically’—a stance that already in 1997, two years after the IPCC’s Second Assessment Report documenting the existing scientific consensus, was disingenuous at best.⁶² Whereas Teller is keen to exaggerate the level of uncertainty of climate science and to cast doubt even on the very existence of anthropogenic climate change—at one point lamenting that policymakers were considering ‘spending \$100 billion or so each year to address a

⁶¹ All quotations in the remainder of this section are from E. Teller, “The Planet Needs a Sunscreen,” *The Wall Street Journal* (22 October 1997), 10.

⁶² Ben Almassi, drawing on Annette Baier’s idea of a “test of moral decency” regarding those who present themselves as trustworthy authorities, argues that “those testifying publicly either for or against the claim that ‘the science is settled’ concerning climate change [...] fail this moral test [...] if they testify ambiguously, unconscientiously, in a way that preys on public ignorance of how ‘consensus’ and ‘settlement’ (or lack thereof) are being operationally defined’” (“*Climate Change, Epistemic Trust, and Expert Trustworthiness*,” *Ethics and the Environment* 17 (2012), 46); Teller’s op-ed piece clearly fails this test.

problem that may not exist⁷—he is equally keen to play down the uncertainties attaching to his own preferred solution to any climate problems that might arise further down the line, i.e. geoengineering. Thus, Teller claims (without evidence beyond mere ballpark figures of the estimated costs of ‘price-rat[ion][ing] fossil fuel usage’ versus the ‘deliberate, large-scale introduction of [...] fine particles into the upper atmosphere to offset global warming’) that geoengineering is in fact already feasible using current technologies, claiming that ‘contemporary technology offers considerably more realistic options for addressing any global warming effect than politicians and environmental activists are considering.’ The use of epistemic double standards is especially evident in the final part of Teller’s piece, which again overstates the uncertainty of the scientific evidence and pits it against the subjective certainty of the belief that human ingenuity can be relied upon to find a technological solution:

... while we still don’t know whether anything really needs to be done—let alone what exactly—let’s use innovation and technology to offset any global warming by the least costly means possible. While scientists continue research into any [*sic*] global climatic effects of greenhouse gases, we ought to study ways to offset any possible ill effects.

From a purely epistemic (truth-oriented) viewpoint, it is irrational to reject an evidence-based consensus view as too uncertain while at the same time granting certainty to speculative technofixes that lack evidence—beyond mere wishful thinking—as to their deployability and effectiveness. Yet from the perspective of dissonance-reduction, it is easy to see why a technological solution that celebrates human ingenuity and agency by insisting that humans should engage in *more* interventions in the climate system, has greater appeal to an agent with strong commitments to individual freedom of enterprise than a solution that aims at *reducing* the human ‘footprint’ on the

environment by, as Teller sees it, waging a ‘fashionable [...] all-out war on fossil fuels and the people who use them.’⁶³

Similar epistemic double standards, pitting doubt about scientific evidence—where such evidence would suggest restrictions on individual behaviour—against subjective certainty about speculative technofixes, can be found in a number of climate sceptics. For example, Myanna Lahsen reports William Nierenberg—a member of the ‘physicist “trio” supporting the backlash against global warming’—as on the one hand dismissing the scientific link between excessive UV-B irradiation and skin cancer (‘Do you know that there is no real evidence of melanoma being caused by ultra-violet B?’), while, on the other hand, affirming staunch belief in the easy resolvability of, among others, the problems of nuclear waste disposal and reactor design (‘in 40 years, 20 years, we can solve them cold’).⁶⁴ Even in more balanced discussions with a policy-relevant angle, this pattern is often echoed, attesting to the influence subtle shifts of epistemic standards can have on the public debate. Thus, in an influential piece on geoengineering, published in *Foreign Affairs*, the authors—although cognizant of the fact that the anthropogenic greenhouse effect constitutes ‘a dangerous geophysical experiment’—selectively lower their epistemic standards when it comes to assessing the prospects of geoengineering as a solution to the problem, presenting the sci-fi scenario of ‘self-levitating

⁶³ Jay Michaelson notes that geoengineering ‘is consonant with a wider and deeper conservative view that, essentially, the market and human innovation will eventually solve whatever problems they have created, with no need for complex and freedom-abridging government intervention’; J. Michaelson, *Geoengineering and Climate Management: From Marginality to Inevitability*, in W. C. G. Burns and A. L. Strauss (eds.), *Climate Change Geoengineering: Philosophical Perspectives, Legal Issues, and Governance Frameworks* (Cambridge: Cambridge University Press, 2013), 81-114, here 98.

⁶⁴ Quoted after Lahsen, “Experiences of Modernity in the Greenhouse,” 211.

and selforienting designer particles engineered to migrate to the Polar Regions’ (where they would cool the planet) as a realistic prospect and asserting a—likewise fictitious—‘general agreement that [geoengineering] strategies are cheap.’⁶⁵ Blurring the line between technological fantasy and evidence-based science, although more subtle than Teller’s contrarian distortion of the state of climate science, may itself be thought of as a form of ‘double standards,’ in that it actively conflates different argumentative registers. How such a move may be turned into a sceptical strategy will be briefly discussed in the next section.

VII

The Cognitive Basis of Epistemic Corruption

In his book *A Perfect Moral Storm: The Ethical Tragedy of Climate Change*, Stephen Gardiner identifies as one of the factors contributing to the ‘perfect moral storm’ the danger of moral corruption.⁶⁶ Moral corruption, on Gardiner’s account, threatens whenever agents fail ‘to protect themselves against rationalization, self-deception, and moral manipulation’ and give in to the temptation of ‘pass[ing] the buck onto the poor, the future, and nature’ (p. 301)—for example, by playing off individual self-interest against collective responsibility, or by failing to evaluate

⁶⁵ D. G. Victor, M. Granger Morgan, J. Apt, J. Steinbruner and K. Ricke, “The Geoengineering Option: A Last Resort Against Global Warming?,” *Foreign Affairs* 88 (2009), 64-76; here 69. The potential of engineered nanoparticles that might exploit photophoretic levitation is explored, albeit only as an—as yet unrealized—theoretical possibility, in D. W. Keith, “Photophoretic Levitation of Engineered Aerosols for Geoengineering,” *Proceedings of the National Academy of Sciences (US)* 107 (2010), 16428-16431.

⁶⁶ S. Gardiner, *A Perfect Moral Storm: The Ethical Tragedy of Climate Change* (New York: Oxford University Press, 2011).

proposed solutions to climate change by ethical standards that appropriately account for the intergenerational dimension of the problem—which would require breaking out of the ‘tyranny of the contemporary’ (p. 143). This danger is especially acute for complex problems like climate change, where the wide range of morally relevant variables allows for subtle, yet highly effective, rationalizations and distortions that may gradually chip away at the recognition of a serious moral commitment, instead bringing the agent’s overall judgment in line with his narrow self-interest.

Yet moral corruption is not the only kind that is relevant to today’s political debate about the challenge of climate change. In an appendix to his book, Gardiner discusses what he aptly calls ‘epistemic corruption,’ that is, the tendency to ‘invoke [...] skepticism selectively against climate science’ on the basis that it leaves logical room for doubt when, in fact, ‘almost everything else that we claim to know, is vulnerable to the same charge’ (p. 462). Gardiner illustrates the phenomenon of ‘epistemic corruption’ by analyzing Michael Crichton’s popular techno-thriller *State of Fear* which has eco-terrorists committing mass murder to spread the message of the dangers of global warming. As Jon Adams has noted, the plot of *State of Fear* ‘requires that the dangers posed by climate change have been greatly exaggerated,’ since the novel is built around the idea that an environmentalist ‘charity machine,’ whose legitimate causes had run out of the steam by the 1970s, has been guilty of concocting various environmental dangers ever since. A novelist is, of course, free to invent any storyline he wishes, but Crichton regularly peppers his texts with scientific references and, in the case of *State of Fear*, adds an op-ed style postscript which is overtly non-fictional. By blurring the line between popular fiction and popular science in this way, and eliding the distinction between what is fictional and what is fact, Crichton effectively manipulates the reader—which is perhaps a lesser achievement than it might first appear, given

that fiction is, after all, entirely under the author's control. As a result, as Adams puts it, '[t]he facts about climate change are cast into doubt by their association with fictional villains.'⁶⁷

One might argue that Crichton's book is simply a piece of 'climate-sceptic' agitprop, intended to convert naïve readers to his ideological cause. By contrast, I wish to suggest that it exhibits precisely the hallmarks of epistemic double standards identified earlier, including unreasonable demands of absolute certainty (which, given the timeliness constraint discussed in Section 3, would be self-defeating). For example, Crichton casually issues the following demand: 'Before making expensive policy decisions on the basis of climate models, I think it is reasonable to require that those models predict future temperatures accurately for a period of ten years. Twenty years would be better.'⁶⁸ While rhetorically effective, this demand is misplaced since, of course, future temperatures depend also on future economic activity and fossil fuel consumption, which are unpredictable not through any fault of the climate models *per se*, but because of the uncertainty of socio-economic activities. Given that retrodiction (of past climate developments) is structurally identical to prediction (of future events) as a test of a model's validity, Crichton's demand expresses at best a folksy preference for what some people happen to find more psychologically convincing.

Considering that, in 2005, Crichton testified as an expert before a U.S. Senate Committee on environmental issues, his epistemic double standards, although originating in a fictional context, can plausibly be expected to have had a distorting effect on epistemic proceedings in the real world. Just as Andrew

⁶⁷ J. Adams, *Real Problems With Fictional Cases*, in P. Howlett and M. S. Morgan (eds.), *How Well Do Facts Travel? The Dissemination of Reliable Knowledge* (Cambridge: Cambridge University Press, 2010), 167-191, here 184.

⁶⁸ Quoted after S. Gardiner, *A Perfect Moral Storm*, 459.

Wakefield, the fraudulent doctor in the MMR vaccine controversy, abused the institution of science, so Crichton, by freely mixing fact, fiction, and fable, wantonly engaged in the undermining of standards of evidence and consistency, thereby contributing to the spread of epistemic corruption. But epistemic corruption extends far beyond the realm of those who give distorted portrayals of climate change in lowbrow literature or in the media. If selective adjustment of epistemic standards with the goal of protecting one's current belief system or preference structure is the hallmark of epistemic corruption, then the case of Edward Teller, discussed in Section 6, is as clear an example of epistemic corruption as one can expect to find.

VIII

Conclusion

What I have attempted to show in the present paper is that moral and epistemological considerations are deeply intertwined in the debate about global climate change. For one, under conditions of urgency, it may be morally irresponsible to delay policy-making until such time as conclusive scientific data has been obtained. However, the situation is exacerbated further if standards of conclusiveness are themselves subject to selective adjustment by interested parties. This is precisely what occurs in cases of epistemic corruption. Yet, beyond the merely descriptive point that in certain situations epistemic double standards are being applied, I have also identified dissonance reduction as a cognitive mechanism at the heart of epistemic corruption. While this implies that the causes of epistemic corruption may run as deep as the ideological roots of those who resort to it in public debate, it also suggests new ways of breaking the stalemate—by

framing possible measures to combat climate change in ideologically neutral terms and, perhaps more importantly, by calling to account those who engage in epistemic corruption and confronting irresponsible ideologies head-on. Whether this makes the task of living up to the moral challenge of climate change more promising or more daunting remains to be seen.⁶⁹

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⁶⁹ Parts of this paper were presented at the *Fourth Annual Meeting of the Society for the Study of Nanoscience and Emerging Technologies* (S.NET), held at the University of Twente, the Netherlands, in October 2012, and at a Departmental Seminar of the Graduate School of Science and Technology Policy, Korea Advanced Institute of Science and Technology, Daejeon, also in October 2012. I am grateful to audiences on both occasions for their helpful and incisive comments. I would also like to thank Ingmar Lippert and two anonymous reviewers for their detailed and insightful comments on an earlier draft of this paper.

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SYMPOSIUM
A CHANGING MORAL CLIMATE



THE INTERGENERATIONAL STORM:
DILEMMA OR DOMINATION

BY PATRICK TAYLOR SMITH

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The Intergenerational Storm: Dilemma or Domination

Patrick Taylor Smith

Abstract. This paper is both a critical engagement and expansion of Stephen Gardiner's analysis of the intergenerational storm in *The Perfect Moral Storm* and other works. In particular, this paper focuses on the Pure Intergenerational Problem (PIP). It follows Gardiner in treating the PIP as a paradigm case in the analysis of intergenerational justice but rejects Gardiner's claim that the best way to view the PIP is as a *coordination problem* akin to the Prisoner's Dilemma or Tragedy of the Commons. Rather, the very elements of the PIP that, according to Gardiner, make it such a pernicious coordination problem—that is, the asymmetric positioning of power and vulnerability between the present and the future—point to an intergenerational *domination* analysis rather than one of coordination. The paper then goes on to show that a domination analysis has several advantages over one that focuses on coordination, cooperation, and reciprocity. The final section of the paper discusses the objection that domination is an otiose moral concept in intergenerational contexts because it is inescapable. In order to respond to this worry, the paper suggests a variety of institutional reforms that can help alleviate the problem of intergenerational domination.

I

Introduction

Stephen Gardiner, in *The Perfect Moral Storm*, argues that anthropocentric climate change represents an especially pernicious admixture of three particularly intractable problems: the global storm, the theoretical storm, and the intergenerational storm.¹ My paper concerns the last and may help address the second. In his discussion of the intergenerational storm and in previous works, Gardiner draws an analogy between coordination problems like the Prisoner's Dilemma and what he calls the Pure Intergenerational Problem (PIP). On Gardiner's view, the PIP—while being akin to other coordination problems—is actually far worse and much less solvable because the future is asymmetrically disadvantaged with respect to the present. The severity of the PIP motivates a particularly deep pessimism about the prospect of any generation acting decisively to prevent the negative consequences of climate change for future generations. My paper evaluates and extends that claim in three sections. The first section argues that the extremity of the asymmetry between generations decisively undermines the claim that the PIP represents a coordination problem at all. This has two surprising consequences. First, the asymmetry of the PIP undermines *structural* pessimism, based on the intergenerational storm, about the likelihood that generations will act to block the serious consequences of climate change. Second, the asymmetry of the PIP makes it unlikely that concepts like 'reciprocity' or 'cooperation' will be especially useful in guiding our accounts of intergenerational justice. So, in the second section, I suggest that what the PIP shows is that our accounts of intergenerational justice ought to be more responsive to the concern that the

¹ Stephen Gardiner, *A Perfect Moral Storm* (Oxford: Oxford University Press 2011).

present *dominates* the future. Finally, I respond to the most serious objection to the domination-oriented analysis of intergenerational justice: that the asymmetric position of the present and future makes the concept otiose.

II

Gardiner's Account of the Pure Intergenerational Problem

The key element of Gardiner's 'intergenerational storm' is what he names the Pure Intergenerational Problem (PIP). The PIP serves several purposes. It is supposed to show that, even if we came to substantial agreement about what intergenerational justice demanded, each generation would be faced with a 'collective action problem' akin to a Prisoner's Dilemma or the Tragedy of the Commons and that the intergenerational structure of the problems makes it much worse than those more familiar problems. Finally, Gardiner is quite pessimistic about the prospects that generations will coordinate on climate change as a result of this intergenerational dynamic. What's more, Gardiner is *structurally* pessimistic; the badness and injustice of climate change are the result of a predictably rational response to the incentive structures the present generation faces. Yet, I will argue that the very asymmetry that makes the intergenerational dynamic so inescapable has the surprising effect of *freeing* each generation from the structural constraints that might prevent them from effectively responding to global warming.

The foundation of Gardiner's analysis is that the preference dynamic facing the present generation—in the context of the Pure Intergenerational Problem—is similar to that facing players in 'standard' game-theoretic collective action problems like the

Prisoner's Dilemma (PD). I plan to show that despite the surface similarities between the PIP and the PD, the normative foundations of these two problems are actually quite different. To illustrate this point, we need to look at why the PIP is worse than the PD. When we do so, two things will become clear. First, we should not be *structurally* pessimistic with regards to the intergenerational storm, though we might want to be pessimistic for other reasons. Second, notions of 'reciprocity' and 'coordination' are not going to be particularly helpful in describing the requirements of intergenerational justice.

Let's begin with the Prisoner's Dilemma.² Imagine two individuals have been arrested for a crime. In separate rooms, the prosecutor offers each a deal. If both individuals stay quiet (they cooperate with each other), the prosecutor will only be able to convict the two arrested individuals with a lesser crime, so each person gets one year. If one person confesses and implicates the other, that confessor will go free (zero years) and the person who stays quiet will receive the entire ten-year sentence. If both people confess, they will each receive half of the sentence for the crime (five years apiece).

Here is a diagram of the incentive structure, with years and preference rating:

2 This description of the Prisoner's Dilemma is adopted from Stephen Gardiner, "The Real Tragedy of the Commons," *Philosophy and Public Affairs* 30 (2001), 387-416, at 391-393.

		A	
		Don't confess	Confess
B	Don't confess	1, 1 (2 nd , 2 nd)	10, 0 (4 th , 1 st)
	Confess	0, 10 (1 st , 4 th)	5, 5 (3 rd , 3 rd)

Fig. 1: diagram of the incentive structure

Now, it looks like the preference ordering of each player is this:

- 1) I confess while the other person stays silent. (Zero years)
- 2) Neither of us confess. (One year)
- 3) Both of us confess. (Five years)
- 4) I remain silent, but the other person confesses. (Ten years)

The reason this is described as a dilemma and a coordination problem is that, in the absence of any assurance of cooperation from the other person, it looks like the thing to do is to confess. After all, no matter what the other person does, the player minimizes their jail time by confessing. In other words, if the opposing player will remain silent, then you can avoid a year in jail. But if your compatriot *fails* to stay silent, then your

confession serves a protective role since you get only five years as opposed to ten. Importantly, cooperating with your confederate *exposes* you to additional danger since the confederate's lack of cooperation will make your outcome much worse. Unfortunately, the players are symmetrically and equally situated, so they both will come to the conclusion that the best thing to do is to confess. But this leads to a suboptimal result: both players will end up with their third preference (both confess) *despite* the fact that they would both prefer that they both stay silent. So, as Gardiner says:

PD1: It is *collectively rational* to cooperate: each agent prefers the outcome produced by everyone cooperating over the outcome produced by no one cooperating.

PD2: It is *individually rational* not to cooperate: when each individual has the power to decide whether or not she will cooperate, each person (rationally) prefers not to cooperate, whatever the others do.³

So, every person in the game acts rationally, yet these players produce an equilibrium that they themselves recognize as sub-optimal and this is a result of the *incentive structure* within the game.

The incentive structure of the PIP is somewhat akin to the PD. Here is how Gardiner describes the PIP:

Suppose that we are dealing with front-loaded goods of a particular kind. They give modest benefits to the group that consumes them (and only to them), but impose very high costs on all later groups. Under the conditions of the pure scenario—where each group is only concerned with what happens while it is around—consumption of these goods is to be expected. We would predict that earlier groups will choose to consume the modest benefits available to them and thereby impose very high (and uncompensated) costs on later groups. We might also expect that those further along in the sequence would receive escalating burdens, since the costs will be compounded over time. Later generations bear the costs

³ S. Gardiner, *A Perfect Moral Storm*, 26.

passed on to them by each one of their predecessors, and the later a generation is, the more predecessors it has.⁴

The key elements are as follows. First, in the PIP generations are non-overlapping.⁵ Second, each generation's choices can influence future generations but not the past. Third, there exist goods—temporally diffuse goods—that can be either consumed or conserved. If consumed, they benefit the present consumer while imposing substantial costs on the future. If conserved, the present will be somewhat less well-off and the future will not have to pay those substantial costs. So let's compare the PIP preference ordering to the PD. Each generation has the following priorities:

- 1) The present generation consumes the temporally diffuse good while all other generations conserve.
- 2) Each generation conserves.

⁴ Ibid., 151.

⁵ This simplifies the model, and I will use an account of 'generation' that assumes very little overlap. In any case, Gardiner is not optimistic that the overlapping nature of familial generations (grandparents, parents, and children) will do much to change the dynamic of the PIP and is skeptical that 'chains' of overlapping generations will do so either. See Stephen Gardiner, "A Contract on Future Generations," in *Intergenerational Justice*, edited by Axel Gosseries and Lukas Meyer (Oxford: Oxford University Press 2009) at 97-114 for details, Hugh McCormick, "Intergenerational Justice and the Non-Reciprocity Problem," *Political Studies* 57 (2009), 451-458; and Joseph Heath, "The Structure of Intergenerational Cooperation," *Philosophy and Public Affairs* 41, (2013), 31-66 for the opposing view. I share Gardiner's skepticism. The most important reason for using a model with non-overlapping generations is that it brings out the most serious problem of intergenerational ethics: how should we treat people that we have no significant or reciprocal connection? What's more, we shall see that concentrating our attention on those with whom we have no connection and do not interact helps bring the problem of domination into sharp relief.

3) Everyone consumes.

4) The present generation conserves while all other generations consume.

This recapitulates the PD incentive structure at the intergenerational level. Each generation will consume since they will have ‘no control’ over whether future generations cooperate. Why risk being exploited by conserving when a future generation may simply take that as a reason to consume? So, if other generations consume, the current generation should also take a share of the goods and gain some benefits to outweigh the costs of other generations’ consumption. And if other generations conserve, then one can gain the benefits of consumption at no cost. Yet, when every generation reasons similarly, what we have is a catastrophic equilibrium where all generations consume, inflicting severe costs on the future.

But this undersells the problem; the PIP is actually *worse* than the PD. There are two general reasons for this, but both are based on the fact that players in the PIP are not symmetrically positioned. Rather, generations are organized sequentially. So, this means that the *first* generation in the PIP has no incentive to cooperate.⁶ After all, since they are first, they do not gain through a general policy of conservation as there are no costs that would otherwise be imposed on them to be prevented. So, unlike the PD, where everyone does have *some* incentive to do the collectively rational thing (it is, after all, their second preference), in the PIP, the first generation lacks that incentive, and, as a consequence, each subsequent generation lacks that incentive as they face the choice to cooperate or defect. Second, each

⁶ The first generation is really the first generation to be in a technological position to exploit the temporally diffuse goods.

generation is in a dominant position to determine their policy with regard to future generations. Gardiner argues that there are six features that place the contemporary in such a superior position, but the overall point is this: the present generation is in a position to influence future generations, but not vice versa, and the future is dependent upon the past and present for the protection and maintenance of its interests. As a consequence, the standard solutions to the PD do not apply to the PIP. There can be no external, third party coercer that assures compliance since there is no obvious way to construct a transgenerational sovereign.⁷ Further, since generations occur sequentially and don't interact, then standard tit-for-tat strategies that can resolve iterated PDs are inapplicable. Finally, strategies that depend upon either affection or a sense of fair play seem unpromising because generations do not regularly interact and individuals suffer from motivational limitations. In other words, the vastly superior position of the contemporary and the relative distance between the present generation and future generations undermine various strategies for resolving the dilemma.

So, unlike the arrestee in a prisoner's dilemma or a polluter in a tragedy of the commons, the generation that is deciding whether to consume a temporally diffuse good and thus impose significant, unjustified costs on the future is *not* symmetrically positioned with regard to the other players. The current generation determines its policy, but the next player in the game (the next generation) is not then symmetrically determining its policy with regards to the prior generation. That's impossible; the sequence goes in only one direction. The current generation or the influenced future generations cannot—even in principle—

⁷ This is, famously, Hobbes's solution. See Thomas Hobbes, *Leviathan*, edited by A.P. Martinich, (Peterborough, Canada: Broadview Press 2002) 125-129.

signal their desire to cooperate or create a reputation for cooperation.

In fact, the position of the present generation in the PIP is so dominant that it changes the moral dynamic of the problem when compared to the PD. In the PD, an important element of the dilemma is the sense of *mutual vulnerability*. The individuals in the PD become worse off if they stay silent while the other agent confesses. By cooperating with her confederate, the cooperator exposes herself to significant costs. It is this interaction with another player that gives the PD its strategic character. Similarly, let's consider Tragedies of the Commons (essentially, multi-player versions of the PD). Suppose we are looking at multiple widget-producing firms that are deciding whether to emit pollution into a shared, unregulated river. Each firm might wish to preserve the river unpolluted over every firm polluting and thereby spoiling the river. But if any individual firm can pollute without consequence (suppose that no individual firm's pollution will spoil the river) and no firm can afford to forego the competitive market advantage provided by fobbing the negative externalities of widget production onto the commons, the individually rational thing for each firm to do is to pollute. That is, if some firms can manufacture their widgets more cheaply by polluting, then the decision of other firms not to pollute will expose them to a significant cost (they will lose market share, assuming that consumers don't actively favor environmentally-minded firms) while not gaining them any significant benefit as the river becomes polluted. In 'standard' collective action problems, those trapped in the tragedy or the dilemma are so ensnared because any attempt to cooperate exposes them to exploitation by their fellow players.

This element of exposure and vulnerability is one reason why PDs are morally complex. The reciprocal vulnerability plays a bit

of an exculpatory role in our moral evaluation of those who defect. We might admire those who expose themselves by cooperating, but defection at least seems *reasonable* when one has no assurance that others will cooperate.⁸ We are tempted to think that people are not required to be suckers. The vulnerability thus strengthens our structural pessimism: it not only, as an empirical matter, increases the likelihood of defection, but we think that defection is an understandable and rational response to the incentives the players are faced with. However, when one removes that vulnerability, then the demand to do the ‘right’ thing and cooperate seems much less problematic. Imagine a polluting firm with such a dominant market position that they can use a cleaner, more expensive widget manufacturing process without risk of being out-competed. It seems right to say that this firm has a stronger moral obligation to stop polluting than one small firm among many that risks destruction through unilateral action. Similarly, Hobbes argues that the reduction of mutual vulnerability makes the international state of nature quite different from the domestic:

[...] yet in all times, kings, and persons of sovereign authority, because of their independency, are in continual jealousies, and in the state and posture of gladiators; having their weapons pointing, and their eyes fixed on one another; that is, their forts, garrisons, and guns upon the frontiers of their kingdoms; and continual spies upon their neighbors; which is a posture of war. But because they uphold thereby, the industry of their subjects; there does not follow from, that misery, which accompanies the liberty of particular men.⁹

⁸ There might be cases where this isn’t true if the consequences of defection are relatively minor and the benefits of cooperation are large, but generally I take one of the reasons the prisoner’s dilemma is a *dilemma* is partly because the person who defects has good reasons for doing so.

⁹ T. Hobbes, Thomas, *Leviathan*, 96-97.

States can cooperate and act internationally in a way that is less driven by the dynamics of the PD because the greater, corporate capacities of the state make them less vulnerable to defection by the other actors in the system. In other words, it appears that the more immune the player is from retribution in these kinds of strategic games, the less the game looks like a dilemma and the stronger the obligation to cooperate.

Yet, the PIP lacks this element of mutual vulnerability. The features that make the PIP so apparently intractable are the very features that eliminate the exposure of the cooperators. Let's consider the decision to consume or conserve from the standpoint of the current generation. The extent to which previous generations have conserved or consumed the relevant resources is now fixed.¹⁰ This generation must then decide whether to consume the temporally diffuse goods to an unreasonable extent and thus whether to 'cooperate' with future generations. It might be true that any generation would like to consume resources and impose the costs of that consumption on others, but that self-interested motivation is insufficient to generate a dilemma. As we saw above, it is the element of *exposure*

¹⁰ The *fully* sequential nature of these interactions is what creates a disanalogy between the PIP and cooperative endeavors like, say, retirement insurance, *pace* Joseph Heath ("Review of Intergenerational Justice," edited by Axel Gosseries and Lukas Meyer, *Ethics*: 120 (2010), 851-855). If the costs of temporally diffuse goods are sufficiently in the future, then no person we interact with will need to pay for the consequences of *our* consumption of the good, though we may very well see the effects of consumption that came before us. In a retirement insurance scheme, we regularly interact with the individuals we support and then regularly interact with individuals that support us. We *can* be punished by later individuals if we defect and refuse to support those dependent upon us. In the *PIP*, we quite literally *cannot* be punished for defection. This is why tit-for-tat strategies are not applicable: PIP-generations do not interact in the kind of way that allows these sorts of iterative strategies to succeed.

that generates the moral complexity in standard coordination problems. In the classic examples, players must worry that when cooperating they will be disadvantaged or harmed by the defection of other players. They might spend more time in jail or lose market share. But in the intergenerational case, there does not appear to be any relevant disadvantage. The cooperate/defect dyad is not worse than cooperate/cooperate for the first player. It is true that the first or present generation will need to forego the benefits of the temporally diffuse goods, but this would be true *regardless* of what future generations do. The superior, temporal position of the present immunizes it from the claims of the future, but it also means that they can cooperate without risk of costs greater than whatever benefits they give up by cooperating. On this view, the present generation is like the dominant firm deciding whether to pollute, more or less entirely free to conserve without risking any negative consequences.

Now, one might wish to argue that if the present conserves and the future consumes, then the present's conservation is 'wasted' and that this represents a 'cost' akin to the cost paid by spurned cooperators in PDs. But this kind of cost seems fundamentally different than that facing those who find themselves in the PD or Tragedy of the Commons. In the latter cases, the preference appears to be undergirded by significant material penalties: spending one year in jail as opposed to ten years is a strong foundation for preferring defensive defection over risky cooperation. But in the PIP, what founds the preference is an anticipatory desire not to have one's cooperation wasted. Yet the current generation will never be even made *aware* of whether their cooperation is 'rewarded' and will not suffer any negative consequences for the future's potential defection. In the PIP, the current generation does not expose itself; there is—quite

literally—no difference to the current generation between a future generation’s cooperation and its defection.¹¹

This feature seems to undermine the ways in which the PIP leads to a ‘structural’ pessimism concerning the possibility of generational action on climate change. Consider the following case:

COMATOSE VICTIM: Catherine comes across the trapped, comatose body of James and she notices that he has a locked suitcase full of valuables handcuffed to his forearm. It would be easy to remove the briefcase but this would cause considerable harm to James. Catherine has no means of helping James and she has decisive moral reasons to continue on her journey. Thus, she has a choice of leaving James alone or taking his briefcase. Catherine does know, however, that other people will be travelling along this path, including less obviously virtuous individuals like Isabella.

¹¹ There are at least two ways to resist this conclusion that I don’t have time to discuss in detail. First, there might be *intergenerational* projects that later generations can undermine as a way of punishing the present generation’s defection. Similarly, we could adopt a *preference-satisfaction* account of welfare. Then, the failure of the future to act to satisfy the present’s preference that their cooperation not be wasted would make the present generation worse off even after every member died. In the first case, I do not find it likely that our intergenerational projects, especially when it comes to projects that motivate us multiple non-overlapping generations into the future, will be sufficiently robust as to derail these dynamics. Second, setting aside the obvious problems with the idea that preferences satisfied or unsatisfied could affect my welfare after I die, I am left wondering why it matters *to the present* that this *particular* preference goes unsatisfied. After all, it makes no material difference in terms of the resources available to them to lead decent lives. I don’t deny that individuals have these preferences, but I deny that the preferences in the PIP and those in the PD are of equal normative importance.

Like the PIP, this is a sequential problem; Catherine can do little to influence Isabella and Isabella can operate, essentially, with impunity. Should we describe COMATOSE VICTIM as a ‘collective action’ problem between Isabella, James, and Catherine, with similar exculpatory consequences if either Catherine or Isabella refuses to cooperate? Surely not. Rather, the real question is whether Isabella or Catherine will take advantage of their position to harm James. Of course, Catherine might *prefer* that she get the suitcase over Isabella and might prefer that both refrain from taking the suitcase above all, but it would be stretching the notion of reciprocity or coordination to say that the real issue between the two of them is whether they can form a cooperative equilibrium around taking the briefcase. After all, Catherine can refrain from violating the rights of James *without* any cost to herself. Obviously, there is the ‘risk’ that her restraint will be ‘wasted’ if Isabella does decide to take James’ suitcase, but this is not the same kind of cost facing players in standard coordination games. Isabella might be less virtuous than Catherine, and, as a result, may simply act badly. We can say the same thing about the PIP. If there is some level or rate of carbon emission that does not produce especially dangerous consequences for future generations¹², then we could say that the present generation is faced with a relatively simple choice. The next generation is prostrate before them: the contemporary may take advantage of their superior position or they may not. What the next generation might do should not concern them.¹³

¹² On the issues surrounding the idea of just emissions, see Simon Caney, “Just Emissions,” *Philosophy and Public Affairs* 40 (2012), 255-300, and Megan Blomfield, “Global Common Resources and the Just Distribution of Emission Shares,” *Journal of Political Philosophy* 21 (2013), 283-304.

¹³ This is restricted to the *intergenerational* problem; the current generation does face a substantial *intragenerational* prisoner’s dilemma when it comes to global cooperation in the face of climate change (S. Gardiner, “The Real Tragedy of

Similarly, COMATOSE VICTIM is similar to the PIP in the sense that no person has a *self-regarding* interest in cooperating. Both Catherine and Isabella can defect without suffering any negative consequences; defection by either player does not make the other player worse off, except insofar as the later player will not be able to take the valuables. In other words, the only reason for Catherine to refrain is her other-regarding preference to James well and the same is true for Isabella.

In light of this analysis, it is not clear that we should be *structurally* pessimistic in the way that Gardiner describes, at least with regards to the intergenerational case. When it comes to these collective action problems, structural pessimism is motivated by two factors. These two factors represent, at least in part, the reasons why Garrett Hardin—in his description of the tragedy of the commons—argues that these problems cannot be solved ‘technically,’ they can only be solved by changing the incentive structure each agent faces. First, as was discussed above, it seems to be quite unreasonable to demand that people be altruistic and signal their cooperation when doing so exposes them to significant cost and little potential benefit. The second reason for structural pessimism is the *selection effect* of collective action problems. The basic idea is that, in systems with a particular incentive structure, agents who act ‘irrationally’ in that context

the Commons,” 407ff and *A Perfect Moral Storm*, 104-114). The one intergenerational exception might be that if we knew for certain the future would not cooperate, there was no way to convince them otherwise, and our cooperation would make no difference to any subsequent generations beyond the second.

will be outcompeted and eventually disappear. Hardin suggests that this effect applies in the case of overpopulation:¹⁴

People vary. Confronted with appeals to limit breeding, some people will undoubtedly respond to the plea more than others. Those who have more children will produce a larger fraction of the next generation than those with more susceptible consciences. The difference will be accentuated, generation by generation.¹⁵

So, one reason we should not expect cooperation in Tragedies of the Commons is that those who do cooperate will eventually cease to populate the game as they lose out in comparison to those who act individually rationally. And this is, at least partly, why we shouldn't expect the players in the game to act differently; those that do so end up disappearing. For example, one might argue that polluting firms are selected for in our tragedy of the commons since those firms that act individually irrationally by not polluting will lose market share and eventually go bankrupt.¹⁶

Neither reason for structural pessimism applies in the PIP. The present is not vulnerable to the future. Furthermore, just as the PIP lacks the possibility of reciprocal interaction, selection is also foreclosed. All 'present' generations will possess these advantages and be in a position to decide whether to consume or

¹⁴ S. Gardiner ("The Real Tragedy of the Commons") has convincingly argued that Hardin is not correct about overpopulation in particular. I am simply using Hardin to illustrate the structure of the effect.

¹⁵ Garrett Hardin, "The Tragedy of Commons," *Science* 162 (1968), 1243-1248, at 1247.

¹⁶ Robert Nozick (*Anarchy, State, and Utopia*, (Oxford: Blackwell 1974), 18-22) describes explanations of this kind as 'invisible hand' explanations. Using his terminology, the structural pessimism in a collective action problem is based on a combination of both equilibrium and fitting processes: rational agents are likely to respond to the incentives to defect (equilibrium) and those that cooperate are likely to be removed from the dynamic over time (fitting).

conserve. Conservation does not expose the present to the possibility of losing, bankruptcy, reproductive failure, or any of the selection forces that work in these other models. So, it is not obvious that we have reason to be structurally pessimistic in the context of the intergenerational storm.¹⁷ But perhaps we should be pessimistic regardless. Perhaps it is simply too much to demand that human beings refrain from benefitting themselves when they are in such an easy position to do so; we may not be able to rely on the *other-regarding* preferences of Catherine and Isabella to not take advantage of James. And so, perhaps we should be skeptical that any generation will be so virtuous as to refrain from exploiting those subject to their power just out of the goodness of their hearts. But this is a skepticism brought about by the ability of human beings to refrain from abusing essentially absolute power; we may not be able to resist James's briefcase, but we shouldn't pretend that taking the briefcase is anything but the powerful taking what they will.

III

¹⁷ There are, at least, two sources of structural pessimism in the context of the 'The Perfect Moral Storm' of climate change that these argument leaves untouched. First, there is the problem of the *intra*-generational coordination created by the multiplicity of political actors who have strong incentives to free-ride and defect from any regime to reduce emissions. Second, even if a generation were to have a decisive preference to reduce emissions, it might still be rational to *delay* that emissions policy along the lines of the self-torturer paradox (see Chrisoula Andreou, "Environmental Damage and the Puzzle of the Self-Torturer," *Philosophy and Public Affairs* 34 (2006), 95-108). My argument is only about whether the intergenerational storm as described by the PIP should be a source of structural pessimism. I thank an anonymous reviewer for forcing me to be clearer on this point.

The Domination of Future Generations

The previous section, I suggest, motivates a *domination*-oriented account of intergenerational justice. As I suggested above, the best way to characterize the PIP is not as a collective action problem but rather as a problem of getting the present—which exists in a commanding position to do what it wishes—to stop abusing the future with its over-consumption of temporally diffuse goods. The moral imperative to avoid domination, rather than reciprocity, seems to be a more appropriate normative concept when we are dealing with the unilateral relationship between the present and the future, with the former being much more powerful than the latter. In this section, I outline a theory of intergenerational domination and argue that this is a better foundation for the analysis of intergenerational justice than reciprocity and cooperation.

‘Domination’ is a fairly flexible concept. It is often used descriptively. A game theoretic strategy is ‘strategically dominant’ when it produces a better outcome regardless of what your opponent does. On a variety of measures, a firm might achieve ‘dominance’ when it has a large enough share and influence within its market. Max Weber defined domination as the high likelihood that one’s commands will be obeyed, and feminist theorists have often equated domination to the possession of social, political, and economic power.¹⁸

However, I will use ‘domination’ to refer to a particular type of political injustice. Thus, to claim that a person has been dominated is to claim that they have been wrongfully subject to a particular kind of political power, a subjugation that is intrinsically

¹⁸ Frank Lovett (*A General Theory of Domination and Justice*, (Oxford: Oxford University Press, 2010), 1-10) has a nice introduction to the concept of domination and various theoretical attempts to grapple with it.

inimical to that individual's autonomy, freedom, or status as citizen.¹⁹ Of course, this normative sense is not unrelated to the descriptive senses mentioned above as all of the latter have in common their reliance on the idea of a superior power or superior position. Domination, on my view, occurs when an agent possesses superior power over another *and* is in a position to use that power arbitrarily. This 'arbitrariness' is *not* merely a function of the ends to which that power is put or what principle the powerful agent adopts. Rather, an agent is in a position to exercise power arbitrarily when there are no external and public mechanisms that require the powerful agent to be accountable to those over whom they wield power.²⁰ An important consequence of this view is that a dictator who is in a position to issue whatever commands they wish and see those orders carried out *necessarily* dominates regardless of whether their commands are wise or foolish, compassionate or vicious. After all, whether the common good is served depends upon the whims of a political agent with absolute power. Of course, it is, in some sense, *better* to live under the heel of a benevolent despot rather than a cruel one,

¹⁹ There is a long political and philosophical tradition of arguing that domination is the central example of political unfreedom (Philip Pettit, *Republicanism: A Theory of Freedom and Government*, (Oxford: Oxford University Press, 1997), 17-41). My view is that domination is inherently inimical to *relational-egalitarianism*; it represents a morally problematic relationship between superior and subordinate *even if* that relationship is used to benefit the subordinate (for more, see Elizabeth Anderson, "What is the Point of Equality?," *Ethics* 109 (1999): 287-337, at 312-315).

²⁰ I intend to be fairly ecumenical with this definition of 'domination,' endeavoring to remain agnostic between, for example, Pettit (*Republicanism: A Theory of Freedom and Government*, 52-58) and Bohman (James Bohman, "Children and the Rights of Citizens: Non-domination and Intergenerational Justice," *The Annals of the American Academy of Political and Social Science* 633 (2011), 128-140, at 134-135) as well as others. These disagreements about the nature of domination are important, but nothing I say in the rest of the paper depends upon adopting one conception rather than the other.

but it remains the case that no one should live under anyone's heel.

There are, ultimately, two strategies for resolving the problem of domination in a particular political context. First, one can increase the power of the subordinate or decrease the power of the superior so that there is no asymmetry; without superior power, there is no domination. The second strategy is to structure the superior power so that it is non-arbitrary. Usually, this is achieved by the development of a constitutional order that possesses significant safeguards, checks and balances, and meaningful avenues of contestation and accountability. Completely describing the various constitutional mechanisms that can be used to tame political power is beyond the scope of this essay, but I'd like to describe a particular case: the regulation of police power. In a modern constitutional democracy, law enforcement personnel have considerable power. Indeed, the modern state both came to populate the political landscape because of, and is legally defined by, its possession of essentially irresistible, superior power over its citizenry.²¹ This power has many sources: equipment, training, social status, and institutional organization. Nonetheless, law enforcement agencies do not dominate if they are reliably constrained and publicly accountable. This can be accomplished in numerous ways, but here are some

²¹ Charles Tilly (*Coercion, Capital, and European States, AD 990–1992*, (Cambridge: Wiley-Blackwell, 1992), 14-16) has argued that the reason the modern state came to achieve its primacy in the global political landscape because it was the most effective political formation for the organization of collective violence. The Montevideo Convention defines statehood in terms of the ability of a government to wield power effectively over a defined territory (Thomas Grant, "Defining Statehood: The Montevideo Convention and its Discontents," *Columbia Journal of Transnational Law* 37 (1998), 403-457, at 413-414). Iris Marion Young (*Inclusion and Democracy* (Oxford: Oxford University Press, 2000), 1-3) uses civilian review boards to demonstrate ways in which arbitrary power can be effectively restrained.

specific mechanisms: public laws that delineate the appropriate scope of police power, citizen review boards with the power to discipline police officers, an independent judiciary that can exclude evidence illegally obtained, videotaped confessions that can be evaluated by a jury, internal affairs investigators, and civil liability for wrongful death in the event of unjustified shootings. In each case, these institutions can ensure that the police serve the common good as well as setting out publicly the appropriate uses of police power and the means for addressing the abuse of that power. On this view, these safeguards and constraints are not *simply* instrumentally useful in getting police to behave properly; being subject *only* to power that is meaningfully accountable and contestable is an ineliminable element that partly *constitutes* what is to be free, to be autonomous, or to be part of a minimally just polity.

Gardiner has effectively demonstrated that the present is in a position of vastly superior power when compared to the future. The asymmetries of causal influence and dependence of interests make the future dependent on the present and give the present immense power to structure the choices available to the future. Furthermore, technological and economic developments have undermined the few *internal* checks constraining the present generation while at the same increasing their power to shape the future. In the pre-industrial past, the present generation had to be concerned with the future because caring about the future was an important way of helping the present.²² There was a convergence

²² In other words, the economic production was structured in such a way that hurting the future required hurting the present and that policies that benefitted the future benefitted the present. See my “Domination and the Ethics of Solar Radiation Management,” in *Engineering the Climate: The Ethics of Solar radiation Management*, edited by Christopher Preston (Plymouth: Lexington Books, 2012) for a more detailed discussion of this dynamic. This is similar, in certain ways, to making police officers civilly liable for the consequences of firing their

of interests. If the present ceased to care for their children, they wouldn't have caregivers when they ceased to be productive. If the present refused to care for agricultural infrastructure or burned their fields, then they would starve themselves²³. This does not mean that pre-industrial societies never exploited natural resources in a way that harmed the interests of the future, it is rather that they were more constrained by their own technological limitations and self-interest than industrial societies are. Industrialization in general and the burning of fossil fuels in particular have made two things possible. First, they have vastly increased the scope, scale, and speed of the sorts of activity that will influence the future. Second, they have made possible the exploitation of temporally diffuse goods which benefit the future by imposing costs that won't be immediately felt. As a consequence, the constraints founded on technological limitations and self-interest have been worn away. The lack of intergenerational interaction makes it impossible for there to be *external* checks on the behavior of the present. Now that these internal checks have been substantially reduced, the present is in a position to act unchecked, especially when it comes to the consumption of temporally diffuse goods. The present is now in a position to enrich themselves by causing extensive environmental damage in a sufficiently distant future that is relatively easy for them to ignore.

weapon. If every police officer faced the possibility of torts based upon wrongful death for unjustified killing, this would provide a powerful disincentive for using a weapon negligently or excessively. I have been told personally by police officers that this helps explain why some jurisdictions have larger numbers of questionable uses of force than others.

²³ These distinctions probably help partly explain why some types of environmental degradation are more easily responded to than others. Ozone layer depletion was sufficiently rapid that it directly affected the generation that began using CFCs. So, the present had a strong incentive to deal with the issue, it acted, and the ozone layer has stabilized.

Furthermore, it is clear that this power is being deployed arbitrarily. There is no constitutional order that is shared by both the present and future that could reliably constrain the power of the present. And it is equally clear that the current actions of the present—burning fossil fuels and generating climate change—will impose significant costs on the future.²⁴ What’s more, it seems that whether the present decides to do so is entirely up to the present generation, and it is hard to see how the future could demand accountability or contest the decisions of the present. In fact, the very same causal dynamics that make *reciprocity* impossible seem to make the domination especially intractable and invidious. As a result, we must conclude that the present dominates the future and then uses that dominating position to unjustly benefit itself at substantial cost to the future.²⁵

²⁴ For a thorough discussion of the implications and effects of climate change, see the Working Group II contribution to the Fourth Assessment Report of the IPCC (2007). An updated Working Group II Report will be published in March 2014:

http://www.ipcc-wg2.gov/AR5/AR5_provisional_schedule.html.

²⁵ John Nolt (“Greenhouse Gas Emission and the Domination of Posterity,” in *The Ethics of Global Climate Change*, edited by Denis Arnold, (Cambridge: Cambridge University Press, 2010) has argued that the domination of posterity is, for a variety of reasons, *especially* bad. While Nolt is interested in the domination of posterity, there are key differences between his analysis and mine. The most important of which is that Nolt argues that only domination that results in *harm* is morally problematic. As a consequence, Nolt suggests that what the present must do is to cease harming the future. Of course, I agree that the present should take steps to guarantee that future generations can lead decent lives, but I disagree that benevolent yet dominating power is morally acceptable. A benevolent despot remains a despot. As a consequence, I think a focus on *harmful* domination is much too narrow and exaggerates the moral attractiveness of policy responses like solar radiation management that block the effects of climate change without dealing with the underlying political and economic power structures (see my “Domination and the Ethics of Solar Radiation Management,” for a longer argument to that conclusion). So

Before I turn to potential objections to a domination-oriented account, I would like to present a few reasons why it is superior to accounts of intergenerational justice based upon reciprocity and cooperation. There are many such views. Some argue that we should conceive of intergenerational justice through an intergenerational veil of ignorance designed to fairly distribute the benefits of intergenerational cooperation.²⁶ Others argue that a generation that over-consumes should be conceived as ‘exploiting’ later generations as they take more than their ‘fair share’ of the collective surplus produced by intergenerational cooperation.²⁷ These views share a common notion: we should conceive of generations that are related sequentially or diachronically as a set of cooperators that are engaging in productive activity synchronically. But as Gardiner has shown, generations are *never* in a position to reciprocate the conservationist activity of the previous generation and generations simply don’t interact. Of course, it might nonetheless be true that the best way to conceptualize just relations between generations is as reciprocal cooperators despite the fact they are not, but I would like to spend the rest of this section describing a few reasons why, at the very least, reciprocity views need to be supplemented (and perhaps supplanted) by a domination-oriented view.

unlike Nolt, I am arguing the present should take steps to avoid domination regardless of whether they are using their superior power to harm the future or not. I do think, but cannot argue fully here, that only a non-dominating order will be a reliably non-harmful one.

²⁶ See David Heyd, “A Value or an Obligation? Rawls on Justice to Future Generations,” in *Intergenerational Justice*, edited by Axel Gosseries and Lukas Meyer (Oxford: Oxford University Press 2009).

²⁷ See Christopher Bertram, “Exploitation and Intergenerational Justice,” in *Intergenerational Justice*, edited by Axel Gosseries and Lukas Meyer, and Matthew Rendall, “Non-identity, Sufficiency, and Exploitation,” *Journal of Political Philosophy* 19 (2011), 229-247.

First, while the obligations of cooperation and reciprocity seem to become more specific and concrete as the level and nature of the interactions becomes more robust, domination can become more salient the ‘thinner’ the interactions between subordinate and superior. As there is less and less actual cooperation and less and less reciprocity, then our intuitive sense of what constitutes a ‘fair portion’ becomes more contested since the actual details of the interaction provide less of a guide. As a consequence, our judgments about ‘reciprocity’ become based on more abstract moral considerations and cease to be a meaningful independent guide to how we ought to act. On the other hand, as individuals interact less frequently, the risk of domination increases and the need to avoid domination becomes more urgent. The reason for this is that as individuals interact, the mechanisms for reciprocal checks and mutual negotiation grow in frequency and power. Consider two political and economic relationships.

Posca the Slave: Posca is the household servant of a rich Roman consul. He is involved in the most intimate affairs of the family. He tutors young children, manages household finances, and advises his master. He serves at the pleasure of his *dominus* and may be ordered about, sold, and disciplined at the whim of his master.

Norman the Serf: Norman owes fealty to Henry II of England, owing his land to a kingly grant. However, Norman lives in a distant part of Normandy and, for the most part, lives his life almost entirely independent of any authority except for the local manorial lord.

In both cases, the dominating agent has the ability or capacity to exercise considerable power over the person subject to them,

but Posca's closeness to his master affords him opportunities to become relatively 'indispensable' (by developing irreplaceable skills and knowledge) or to negotiate relationships that check each other (for example, making use of the affection of the son he tutored in order to protect his family from the depredations of a valued free client of the master family). These robust interactions provide opportunities for Posca to increase the costs of exercising power in ways detrimental to his interests, but they also make the exploitation of the slave's labor and skills much more intense²⁸ (that is, the more frequent and closer interactions help masters expropriate the economic product of their slaves; Posca's master gets a lot more from Posca than Henry II gets from Norman). In the king-serf case, the opposite dynamic applies. Henry II is probably not going to expropriate Norman's labor and economic product as easily and intensely as that of those with whom he regularly interacts (in fact, we could imagine certain scenarios where the king receives essentially none of the agricultural production of Norman). But nonetheless, the king is certainly in a deeply problematic political relationship with the serf even if no property is expropriated or is likely to be. And if the king *should* decide to exercise his power against the serf, the lack of prior interaction will deprive Norman of even the small possibilities of negotiation available to Posca. Given this analysis, it would seem that domination would be especially useful when discussing intergenerational justice, which represents the limit case of causal influence without reciprocity.

²⁸ It is important to note two things. First, both Posca and Norman are dominated and subject to severe injustice. Second, I am not claiming that we should *prefer* Posca's situation to Norman's. Rather, I claim that domination is an appropriate and action-guiding moral concept even in cases where infrequent economic interactions make considerations of 'reciprocity,' 'exploitation,' or 'fairness' less relevant and concrete.

Second, a domination-based analysis is oriented towards the *capabilities* of the present that make it possible for them to undermine the interests or life chances of future generations and not simply the *results* of the actions of present and past generations. In other words, if we focus fairly narrowly on the fact of cooperation or non-cooperation between generations, then we can be lulled into concluding that there is nothing morally problematic about the relationship between the generations simply because we happen to (finally) cooperate with the future by conserving temporally diffuse goods.

For example, if we focus on exploitation—defined in terms of taking more than your fair share—then one could conclude that as long as the present generation develops some mechanism for ensuring the future *receives* their fair share, the present has satisfied its obligation to the future. That is, suppose the present engages in a crash program of economic investment so that the future is sufficiently wealthy to effectively adapt to the consequences of unabated global warming: the economic investment could ensure that the future receives an equivalent compensation for the costs of consumption.²⁹ Or suppose the present deploys a series of geoengineering technologies that reduce or eliminate the costs to the future associated with the consumption of temporally diffuse goods. In those cases, it is plausible that, characterized entirely in terms of the distribution of material goods, the present has made its consumption behavior non-exploitative. But, in both cases, the relationship of domination is unresolved. Domination-oriented analyses force us to consider *why* the present is, currently, in a position to unilaterally condition the lives of the future and

29 The point is that domination provides us with a principled reason for rejecting compensatory schemes; there may be others. Compensatory strategies might depend on assumptions about the commensurability of various goods that are implausible (e.g., can we ‘compensate’ future generations being unable to observe polar bears by providing them with additional income per capita?).

motivate us to resolve or change that dynamic as much as possible. On a domination oriented account, a relationship can be morally problematic *even if* the victim benefits from it. We can readily imagine kind slaveowners and benevolent despots, and the largesse of their beneficence does not justify their dominating relationship over their slaves or subjects. So, there are two reasons why we might think that a focus on fair burden-sharing is inadequate. First, as a practical matter, it seems like that even initially fair setups will be unstable if they depend on individual virtue and ignore large power differentials. Second, it seems plausible that dominating relationships are intrinsically problematic political relationships that the provision of adequate distributive shares does not resolve. As a result, certain public policy responses to climate change might be more expensive or difficult but be morally required because they reduce intergenerational domination. Domination-oriented analyses provide principled reasons for rejecting various kinds of economic or technological responses to climate change that represent attempts by the present to rationalize or justify consumption but fail to deal with the underlying power dynamics between the present and future.³⁰

To summarize this section, I have argued that it is better to conceptualize the fundamental³¹ problem of intergenerational

³⁰ See my “Domination and the Ethics of Solar Radiation Management” on geo-engineering as an example of how domination can inform our judgments about the appropriate responses to climate change.

³¹ By ‘fundamental,’ I do not mean to say that only domination matters to intergenerational justice. It could very well be the case that a nondominating order could nonetheless impose unfair burdens and thus could be subject to moral criticism, though it is difficult to imagine a nondominating political system that was characterized by robust institutional protections of the future that then allowed systematic and egregiously unfair burden sharing. Still, a system can be nondominating yet imperfect. Rather, I mean to suggest that the elimination of domination is a necessary component of any account of

justice as the avoidance of domination of the future by the present than as intergenerational cooperation or reciprocity. There are three reasons for this. First, domination captures the dynamics of the PIP, which is marked by a distinct lack of reciprocity or cooperation. Second, while the moral relevance of cooperation and reciprocity becomes less relevant as interactions between agents become less robust, domination retains its significance even when interactions are thin, weak, and infrequent. Third, a focus on domination properly orients our concern towards the power dynamics between generations that allow for the possibility of abuse and exploitation. In the final section, I will consider what I take to be the most important objection to the view.

IV

Objections and Solutions

There appears to be an obvious problem with a domination-oriented analysis. If we conceive of intergenerational justice as cooperation and reciprocity and we understand ‘cooperation’ in terms of simply ensuring that future generations have their fair share of goods or an adequate environment, then the appropriate moral response is easy to describe. We can ‘cooperate’ by refraining from overconsumption or effectively compensating the future for our actions. In the previous section, we criticized the cooperation/reciprocity/exploitation views as being insufficient because they ignore the political relationship of domination that makes cooperation on unfair or one-sided terms possible, but

intergenerational justice and that domination plays a key material role in making other kinds of injustice feasible.

cooperation/reciprocity/exploitation views do have the advantage of providing clear and achievable prescriptions for the present. Yet, if we use a domination analysis, compensating or conserving is, by itself, insufficient. We are also required to *repair* the dominating relationship.

Unfortunately, it is not clear that it is even *possible* to structure the relationship between the present and future so that it is non-dominating. Phillip Pettit describes two basic strategies for resolving problems of political dominations but neither is obviously available in the intergenerational context. First, you can eliminate the superior position of the dominator by equalizing power between the agents. Unfortunately, this seems to be impossible in the intergenerational context. After all, as long as time travels in one direction, the present is always going to possess a superior position over the future. The causal influence and the asymmetric dependence of interests that make the future so vulnerable seem to be necessary and ineliminable features of the intergenerational context.

The second strategy seems no more promising. Pettit has argued that, even if we cannot or should not equalize power, we can reduce or eliminate domination by using a constitutional order of checks and balances to make that power non-arbitrary and accountable.³² Of course, there is no such constitutional order that mutually constrains the present and future generations. But more importantly, it does not seem even *possible* for there to be a common constitutional order between the present generation and those that come after it. Generations, I have assumed, do not robustly overlap. We can readily conceive of a constitutional order that mutually constrains agents that exist together, but it is hard to imagine an order that works for agents oriented diachronically. After all, whatever constraints we build

³² P. Pettit, *Republicanism: A Theory of Freedom and Government*, 67-68.

into a constitutional order must ultimately be adopted *by* the present generation without any interaction or accountability. How are we supposed to design institutions that make the present accountable to the future if the future will never be in a position to interact with the present? If *accountability* and *contestation* are significant elements of political non-domination, then it seems like intergenerational domination is unavoidable; the future cannot contest the actions of the present and, similarly, the present and the future cannot both exist in a shared order of accountability.³³ So, if domination is unavoidable *no matter what we do*, then it appears to be irrelevant in our practical deliberations. To put it another way, if we are necessarily despots, then we ought to concern ourselves with being *benevolent* despots rather than cruel ones. If we must dominate, then we can at least act *as if* we are engaging in reciprocal cooperation with the future even though we really are not.

This is a serious worry and, in many ways, it is similar to the objection I have laid against the cooperation/reciprocity views. Domination looks to be an inappropriate concept to apply to intergenerational justice because intergenerational relations are simply too one-sided for a focus on domination to be helpful.

Before I provide a full response, I want to point out two features of the intergenerational situation that open up the possibility of non-domination in the intergenerational context. First, we need to see that there is a distinction between *formal* power and *substantive* power. Formal power is the kind that that has been and always will be possessed by the present generation in virtue of its relationship to the future: time and causal influence flows in one direction. Formal power, then, is reflected in a kind of bare feasibility. This formal power remains constant while the present's substantive power waxes and wanes. So, it is always

³³ *Ibid.*, 61-63.

within the power of currently existing people to, for example, burn all their crops and act in ways that make the lives of future people worse off without any response from the future. Their formal power is always present, but the technological, economic, and social dimensions of the power of present people have increased in scope, magnitude, and speed while dramatically decreasing in cost. The substantive power of the present has grown because now the present's interventions often have a global effect, have more significant immediate consequences, occur more quickly and cheaply, and can often be accomplished in ways that benefit the present. As an agents *substantive* power increases, so does the intensity of the domination, but if that power decreases, so does the domination. The second element of the response is to realize that generations are, unlike states or corporations, not really agential entities. Throughout this paper, I have discussed what a 'generation' will do in the face of some incentive structure, but this is only a useful shorthand. Theorizing in terms of generations is useful because they describe a certain context and relationship that *a group* of agents, both corporate and individual, share, but we should not let that deceive into thinking that each generation is *itself* a corporate agent. This means that we can use different agents *within* a generation to check each other and develop 'pre-commitment' strategies by which those checks are structured to block harmful or unjust behavior.

With these two elements in mind, there are at least three ways we can reduce domination between generations. Combined, these three mechanisms represent the beginnings of a strategy for producing just, non-dominating relations between the present and the future. First, Pettit has argued that virtue can play a role in reducing domination as long as it takes a particular form. He says:

Does this point mean that no difference is made by the fact, if it is a fact, that the power-bearer is benign or saintly? That depends. If being benign

or saintly means that the person acknowledges that they are subject to challenge and rebuke [...] then that entails that they cannot interfere with complete impunity; they can be quoted, as it were, against themselves [...] If, on the other hand, being benign or saintly simply means that the person happens to have inclinations that do no harm to anyone else [...] then it will not entail a reduction in the domination of those who are under this person's power.³⁴

Not all personal virtues reduce domination. A political agent that is simply nice or kind or compassionate can still nonetheless be dominating since those virtues are, or can be, almost entirely private. However, if one makes a *public* commitment that serves as a vehicle of criticism and contestation, then the virtue of having a kind of integrity, of being bound to match one's behavior to one's public pronouncements can have a robust effect in reducing domination even if it is insufficient on its own. This kind of constraint or cost *is* something that can be applied to the present even if there is no interaction with the future. In other words, if the agents—corporate or individual—of the present generation can make a truly public commitment to treating the future well (perhaps through law) and if those agents either have or can be made to have the virtue of integrity, then that would go some way towards reducing domination.³⁵ By setting a public commitment, one increases the costs of working against the interests of the future, and one also provides a legal and political standard by which those who represent the future achieve uptake in the political and legal systems.

³⁴ *Ibid.*, 64.

³⁵ One possible mechanism for this kind of public commitment, though perhaps not sufficient on its own, is to incorporate counter-majoritarian environmental and fiscal protections into national constitutions. See Joerg Chet Tremmel, "Establishing Intergenerational Justice in National Constitutions," in *Handbook of Intergenerational Justice*, edited by Joerg Chet Tremmel (Cheltenham: Edward Elgar Publishing, 2006).

Second, the fact that generations are not a single agent but are rather composed of many agents provides an opportunity for these agents to check each other even if the future cannot. It is not a necessary feature of domination-oriented analyses of political liberty that the person subject to a superior power be able to *personally* contest the exercise of power as long as someone who can be reasonably construed as representing their interests does have that ability. For example, the political domination of children can be reduced by creating legal mechanisms for the protection of their interests even though children are not, even in principle, in a position to effectively contest the power of their parents.³⁶ Modern states can appoint *guardians ad litem* and have created positions within the political and legal bureaucracies that are empowered to protect children from the depredations of abusive parents. And at a more fundamental level, the very fact that the law—enforced by domestic police and paramilitary organizations—covers children and does not treat the domestic arena of the family as immune from state interference plays an important role in constraining parents, though we might think that such protections are still insufficiently robust. Similarly, we could create legal, political, and bureaucratic regimes that protect the future—and create institutional representation—that contest current policy on behalf of future generations. For example, we could require new projects and developments to file intergenerational impact reports much like we do for the environment. We could create positions where individuals would

³⁶ I am not the first to draw an analogy between the non-domination of children and the non-domination of future generations (see James Bohman, “Children and the Rights of Citizens: Non-domination and Intergenerational Justice,”), but I deploy the analogy differently. Bohman argues that the domination of children and future generations are of one piece while I want suggest that we can use the institutions we have developed to resolve our domination of children as a model for resolving our domination of the future.

be tasked with advocating for future generations in a variety of legal and political contexts.³⁷ In any case, we should be clear not to demand that responses to intergenerational domination be subject to constraints we do not accept in the intragenerational context: contestation and accountability does not need to be *personal* contestation and accountability. Police officers can protect the persons and property of individuals who are not well positioned to protect themselves, and social workers in child services can represent the interests of children who are incapable of representing themselves. Similarly, we can construct institutional mechanisms that can effectively represent the interests of the future even if the future is unable to participate. By serving as an external check and as a mechanism of contestation, these representatives and institutions help generate a kind of legal and political status for those people (i.e., future

³⁷ On the creation of environmental ombudsman, see Benedek Javor, “Institutional Protection of Succeeding Generations – Ombudsman for Future Generations in Hungary,” In *Handbook of Intergenerational Justice*, edited by Joerg Chet Tremmel. On the creation of regulatory commissions dedicated to protecting a sustainable environment, see Shlomo Shoham and Nira Lamay “Commission for Future Generations in the Knesset: Lessons Learnt,” in *Handbook of Intergenerational Justice*, edited by Joerg Chet Tremmel. Andrew Dobson (“Representative Democracy and the Environment,” in *Democracy and the Environment*, edited by William Lafferty and James Meadowcraft (Cheltenham: Edward Elgar 1996)) has argued for the creation of special parliamentary seats where environmental organizations can represent the future, while others have argued for various reforms to either strengthen the voice of the young or weaken that of the old (Philippe Van Parijs, “The Disenfranchisement of the Elderly and Other Attempts to Secure Intergenerational Justice” *Philosophy and Public Affairs* 27 (1998), 292-333). Ludvig Beckman (“Do global climate change and the interest of future generations have implications for democracy?” *Environmental Politics* 17 (2008), 610-624) presents a good summary of the various proposals. My account here has two benefits. First, it can provide a criteria for evaluating these proposals and provide a principled response for why we might constrain the democratic prerogatives of future generations, thus answering Beckman’s worry.

generations) that had previously lacked that status. And insofar as that status leads to more effective guarantees of consideration and contestability, the exercise of the power *by* the present *over* the future becomes less arbitrary.

Finally, the present generation can act to bind itself by *reducing* its substantive power over the future, thus reducing the intensity of their domination over the future. Recall that the growth of the present's substantive power is a consequence of certain developments in technology and economic organization. It is possible to decrease the domination of the future by decreasing the substantive power of the present, at least partly undoing the developments of the past few hundred years. Of course, it is vanishingly unlikely that the present generation will simply forget how to make and use industrial and postindustrial technology, but we can reduce the substantive power of the present by reducing the ease and increasing the cost of deploying particular technologies.³⁸ For example, as I have argued,³⁹ one reason to favor mitigation and adaptation strategies which attempt to reduce emissions and global warming effects over geoengineering strategies that block the effects of those emissions is that the former reduce the substantive power of the present while the latter increases it. In other words, certain kinds of economic organization rely upon, encourage, and perpetuate the over-consumption of fossil fuels. As modern economies have sunk more and more capital into the creation of transportation and production networks that rely on these fuels, a path-dependent dynamic in favor of the rapid and cheap consumption of fossil

³⁸ Rasmus Karlsson ("Reducing Asymmetries in Intergenerational Justice: Descent from Modernity or Space Industrialization?", *Organization and Environment* 19 (2006), 233-250) describes two other strategies for reducing the substantive power of the present: space exploration and colonization, and de-industrialization.

³⁹ See my "Domination and the Ethics of Solar Radiation Management."

fuels and the extensive emission of carbon has deepened and hardened. However, careful intervention into the economy in ways that favor the use of sustainable and renewable energy as well as capital investments in adaptation of the global economy in general and the developing world in particular have the potential to arrest and reverse that dynamic. If it does and transportation, production, and consumption come to rely on the provision of *sustainable* energy and practices, then capital investment and the institutional stickiness of economic organizations will work to *increase* the cost of returning to a cheap emissions equilibrium. This would reduce the substantive power of the present by increasing the costs and difficulties of using high emissions technologies. As substantive power decreases, so does the intensity and urgency of the domination.

In sum, domination-oriented analyses of intergenerational justice can provide meaningful practical advice in the reform of our political, legal, and economic institutions. In order to reduce intergenerational domination, the present will need to make a public commitment to structuring their political and legal institutions in a way that provides for the meaningful representation of the interests of the future. Furthermore, the agents of the present generation will need to restructure their economic and social institutions so that the substantive power of the present is meaningfully constrained and structured in a more sustainable direction.⁴⁰

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SYMPOSIUM
A CHANGING MORAL CLIMATE



THE INTERGENERATIONAL STORM:
DILEMMA OR DOMINATION

BY PATRICK TAYLOR SMITH

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The Intergenerational Storm: Dilemma or Domination

Patrick Taylor Smith

Abstract. This paper is both a critical engagement and expansion of Stephen Gardiner's analysis of the intergenerational storm in *The Perfect Moral Storm* and other works. In particular, this paper focuses on the Pure Intergenerational Problem (PIP). It follows Gardiner in treating the PIP as a paradigm case in the analysis of intergenerational justice but rejects Gardiner's claim that the best way to view the PIP is as a *coordination problem* akin to the Prisoner's Dilemma or Tragedy of the Commons. Rather, the very elements of the PIP that, according to Gardiner, make it such a pernicious coordination problem—that is, the asymmetric positioning of power and vulnerability between the present and the future—point to an intergenerational *domination* analysis rather than one of coordination. The paper then goes on to show that a domination analysis has several advantages over one that focuses on coordination, cooperation, and reciprocity. The final section of the paper discusses the objection that domination is an otiose moral concept in intergenerational contexts because it is inescapable. In order to respond to this worry, the paper suggests a variety of institutional reforms that can help alleviate the problem of intergenerational domination.

I

Introduction

Stephen Gardiner, in *The Perfect Moral Storm*, argues that anthropocentric climate change represents an especially pernicious admixture of three particularly intractable problems: the global storm, the theoretical storm, and the intergenerational storm.¹ My paper concerns the last and may help address the second. In his discussion of the intergenerational storm and in previous works, Gardiner draws an analogy between coordination problems like the Prisoner's Dilemma and what he calls the Pure Intergenerational Problem (PIP). On Gardiner's view, the PIP—while being akin to other coordination problems—is actually far worse and much less solvable because the future is asymmetrically disadvantaged with respect to the present. The severity of the PIP motivates a particularly deep pessimism about the prospect of any generation acting decisively to prevent the negative consequences of climate change for future generations. My paper evaluates and extends that claim in three sections. The first section argues that the extremity of the asymmetry between generations decisively undermines the claim that the PIP represents a coordination problem at all. This has two surprising consequences. First, the asymmetry of the PIP undermines *structural* pessimism, based on the intergenerational storm, about the likelihood that generations will act to block the serious consequences of climate change. Second, the asymmetry of the PIP makes it unlikely that concepts like 'reciprocity' or 'cooperation' will be especially useful in guiding our accounts of intergenerational justice. So, in the second section, I suggest that what the PIP shows is that our accounts of intergenerational justice ought to be more responsive to the concern that the

¹ Stephen Gardiner, *A Perfect Moral Storm* (Oxford: Oxford University Press 2011).

present *dominates* the future. Finally, I respond to the most serious objection to the domination-oriented analysis of intergenerational justice: that the asymmetric position of the present and future makes the concept otiose.

II

Gardiner's Account of the Pure Intergenerational Problem

The key element of Gardiner's 'intergenerational storm' is what he names the Pure Intergenerational Problem (PIP). The PIP serves several purposes. It is supposed to show that, even if we came to substantial agreement about what intergenerational justice demanded, each generation would be faced with a 'collective action problem' akin to a Prisoner's Dilemma or the Tragedy of the Commons and that the intergenerational structure of the problems makes it much worse than those more familiar problems. Finally, Gardiner is quite pessimistic about the prospects that generations will coordinate on climate change as a result of this intergenerational dynamic. What's more, Gardiner is *structurally* pessimistic; the badness and injustice of climate change are the result of a predictably rational response to the incentive structures the present generation faces. Yet, I will argue that the very asymmetry that makes the intergenerational dynamic so inescapable has the surprising effect of *freeing* each generation from the structural constraints that might prevent them from effectively responding to global warming.

The foundation of Gardiner's analysis is that the preference dynamic facing the present generation—in the context of the Pure Intergenerational Problem—is similar to that facing players in 'standard' game-theoretic collective action problems like the

Prisoner's Dilemma (PD). I plan to show that despite the surface similarities between the PIP and the PD, the normative foundations of these two problems are actually quite different. To illustrate this point, we need to look at why the PIP is worse than the PD. When we do so, two things will become clear. First, we should not be *structurally* pessimistic with regards to the intergenerational storm, though we might want to be pessimistic for other reasons. Second, notions of 'reciprocity' and 'coordination' are not going to be particularly helpful in describing the requirements of intergenerational justice.

Let's begin with the Prisoner's Dilemma.² Imagine two individuals have been arrested for a crime. In separate rooms, the prosecutor offers each a deal. If both individuals stay quiet (they cooperate with each other), the prosecutor will only be able to convict the two arrested individuals with a lesser crime, so each person gets one year. If one person confesses and implicates the other, that confessor will go free (zero years) and the person who stays quiet will receive the entire ten-year sentence. If both people confess, they will each receive half of the sentence for the crime (five years apiece).

Here is a diagram of the incentive structure, with years and preference rating:

² This description of the Prisoner's Dilemma is adopted from Stephen Gardiner, "The Real Tragedy of the Commons," *Philosophy and Public Affairs* 30 (2001), 387-416, at 391-393.

		A	
		Don't confess	Confess
B	Don't confess	1, 1 (2 nd , 2 nd)	10, 0 (4 th , 1 st)
	Confess	0, 10 (1 st , 4 th)	5, 5 (3 rd , 3 rd)

Fig. 1: diagram of the incentive structure

Now, it looks like the preference ordering of each player is this:

- 1) I confess while the other person stays silent. (Zero years)
- 2) Neither of us confess. (One year)
- 3) Both of us confess. (Five years)
- 4) I remain silent, but the other person confesses. (Ten years)

The reason this is described as a dilemma and a coordination problem is that, in the absence of any assurance of cooperation from the other person, it looks like the thing to do is to confess. After all, no matter what the other person does, the player minimizes their jail time by confessing. In other words, if the opposing player will remain silent, then you can avoid a year in jail. But if your compatriot *fails* to stay silent, then your

confession serves a protective role since you get only five years as opposed to ten. Importantly, cooperating with your confederate *exposes* you to additional danger since the confederate's lack of cooperation will make your outcome much worse. Unfortunately, the players are symmetrically and equally situated, so they both will come to the conclusion that the best thing to do is to confess. But this leads to a suboptimal result: both players will end up with their third preference (both confess) *despite* the fact that they would both prefer that they both stay silent. So, as Gardiner says:

PD1: It is *collectively rational* to cooperate: each agent prefers the outcome produced by everyone cooperating over the outcome produced by no one cooperating.

PD2: It is *individually rational* not to cooperate: when each individual has the power to decide whether or not she will cooperate, each person (rationally) prefers not to cooperate, whatever the others do.³

So, every person in the game acts rationally, yet these players produce an equilibrium that they themselves recognize as sub-optimal and this is a result of the *incentive structure* within the game.

The incentive structure of the PIP is somewhat akin to the PD. Here is how Gardiner describes the PIP:

Suppose that we are dealing with front-loaded goods of a particular kind. They give modest benefits to the group that consumes them (and only to them), but impose very high costs on all later groups. Under the conditions of the pure scenario—where each group is only concerned with what happens while it is around—consumption of these goods is to be expected. We would predict that earlier groups will choose to consume the modest benefits available to them and thereby impose very high (and uncompensated) costs on later groups. We might also expect that those further along in the sequence would receive escalating burdens, since the costs will be compounded over time. Later generations bear the costs

³ S. Gardiner, *A Perfect Moral Storm*, 26.

passed on to them by each one of their predecessors, and the later a generation is, the more predecessors it has.⁴

The key elements are as follows. First, in the PIP generations are non-overlapping.⁵ Second, each generation's choices can influence future generations but not the past. Third, there exist goods—temporally diffuse goods—that can be either consumed or conserved. If consumed, they benefit the present consumer while imposing substantial costs on the future. If conserved, the present will be somewhat less well-off and the future will not have to pay those substantial costs. So let's compare the PIP preference ordering to the PD. Each generation has the following priorities:

- 1) The present generation consumes the temporally diffuse good while all other generations conserve.
- 2) Each generation conserves.

⁴ Ibid., 151.

⁵ This simplifies the model, and I will use an account of 'generation' that assumes very little overlap. In any case, Gardiner is not optimistic that the overlapping nature of familial generations (grandparents, parents, and children) will do much to change the dynamic of the PIP and is skeptical that 'chains' of overlapping generations will do so either. See Stephen Gardiner, "A Contract on Future Generations," in *Intergenerational Justice*, edited by Axel Gosseries and Lukas Meyer (Oxford: Oxford University Press 2009) at 97-114 for details, Hugh McCormick, "Intergenerational Justice and the Non-Reciprocity Problem," *Political Studies* 57 (2009), 451-458; and Joseph Heath, "The Structure of Intergenerational Cooperation," *Philosophy and Public Affairs* 41, (2013), 31-66 for the opposing view. I share Gardiner's skepticism. The most important reason for using a model with non-overlapping generations is that it brings out the most serious problem of intergenerational ethics: how should we treat people that we have no significant or reciprocal connection? What's more, we shall see that concentrating our attention on those with whom we have no connection and do not interact helps bring the problem of domination into sharp relief.

3) Everyone consumes.

4) The present generation conserves while all other generations consume.

This recapitulates the PD incentive structure at the intergenerational level. Each generation will consume since they will have ‘no control’ over whether future generations cooperate. Why risk being exploited by conserving when a future generation may simply take that as a reason to consume? So, if other generations consume, the current generation should also take a share of the goods and gain some benefits to outweigh the costs of other generations’ consumption. And if other generations conserve, then one can gain the benefits of consumption at no cost. Yet, when every generation reasons similarly, what we have is a catastrophic equilibrium where all generations consume, inflicting severe costs on the future.

But this undersells the problem; the PIP is actually *worse* than the PD. There are two general reasons for this, but both are based on the fact that players in the PIP are not symmetrically positioned. Rather, generations are organized sequentially. So, this means that the *first* generation in the PIP has no incentive to cooperate.⁶ After all, since they are first, they do not gain through a general policy of conservation as there are no costs that would otherwise be imposed on them to be prevented. So, unlike the PD, where everyone does have *some* incentive to do the collectively rational thing (it is, after all, their second preference), in the PIP, the first generation lacks that incentive, and, as a consequence, each subsequent generation lacks that incentive as they face the choice to cooperate or defect. Second, each

⁶ The first generation is really the first generation to be in a technological position to exploit the temporally diffuse goods.

generation is in a dominant position to determine their policy with regard to future generations. Gardiner argues that there are six features that place the contemporary in such a superior position, but the overall point is this: the present generation is in a position to influence future generations, but not vice versa, and the future is dependent upon the past and present for the protection and maintenance of its interests. As a consequence, the standard solutions to the PD do not apply to the PIP. There can be no external, third party coercer that assures compliance since there is no obvious way to construct a transgenerational sovereign.⁷ Further, since generations occur sequentially and don't interact, then standard tit-for-tat strategies that can resolve iterated PDs are inapplicable. Finally, strategies that depend upon either affection or a sense of fair play seem unpromising because generations do not regularly interact and individuals suffer from motivational limitations. In other words, the vastly superior position of the contemporary and the relative distance between the present generation and future generations undermine various strategies for resolving the dilemma.

So, unlike the arrestee in a prisoner's dilemma or a polluter in a tragedy of the commons, the generation that is deciding whether to consume a temporally diffuse good and thus impose significant, unjustified costs on the future is *not* symmetrically positioned with regard to the other players. The current generation determines its policy, but the next player in the game (the next generation) is not then symmetrically determining its policy with regards to the prior generation. That's impossible; the sequence goes in only one direction. The current generation or the influenced future generations cannot—even in principle—

⁷ This is, famously, Hobbes's solution. See Thomas Hobbes, *Leviathan*, edited by A.P. Martinich, (Peterborough, Canada: Broadview Press 2002) 125-129.

signal their desire to cooperate or create a reputation for cooperation.

In fact, the position of the present generation in the PIP is so dominant that it changes the moral dynamic of the problem when compared to the PD. In the PD, an important element of the dilemma is the sense of *mutual vulnerability*. The individuals in the PD become worse off if they stay silent while the other agent confesses. By cooperating with her confederate, the cooperator exposes herself to significant costs. It is this interaction with another player that gives the PD its strategic character. Similarly, let's consider Tragedies of the Commons (essentially, multi-player versions of the PD). Suppose we are looking at multiple widget-producing firms that are deciding whether to emit pollution into a shared, unregulated river. Each firm might wish to preserve the river unpolluted over every firm polluting and thereby spoiling the river. But if any individual firm can pollute without consequence (suppose that no individual firm's pollution will spoil the river) and no firm can afford to forego the competitive market advantage provided by fobbing the negative externalities of widget production onto the commons, the individually rational thing for each firm to do is to pollute. That is, if some firms can manufacture their widgets more cheaply by polluting, then the decision of other firms not to pollute will expose them to a significant cost (they will lose market share, assuming that consumers don't actively favor environmentally-minded firms) while not gaining them any significant benefit as the river becomes polluted. In 'standard' collective action problems, those trapped in the tragedy or the dilemma are so ensnared because any attempt to cooperate exposes them to exploitation by their fellow players.

This element of exposure and vulnerability is one reason why PDs are morally complex. The reciprocal vulnerability plays a bit

of an exculpatory role in our moral evaluation of those who defect. We might admire those who expose themselves by cooperating, but defection at least seems *reasonable* when one has no assurance that others will cooperate.⁸ We are tempted to think that people are not required to be suckers. The vulnerability thus strengthens our structural pessimism: it not only, as an empirical matter, increases the likelihood of defection, but we think that defection is an understandable and rational response to the incentives the players are faced with. However, when one removes that vulnerability, then the demand to do the ‘right’ thing and cooperate seems much less problematic. Imagine a polluting firm with such a dominant market position that they can use a cleaner, more expensive widget manufacturing process without risk of being out-competed. It seems right to say that this firm has a stronger moral obligation to stop polluting than one small firm among many that risks destruction through unilateral action. Similarly, Hobbes argues that the reduction of mutual vulnerability makes the international state of nature quite different from the domestic:

[...] yet in all times, kings, and persons of sovereign authority, because of their independency, are in continual jealousies, and in the state and posture of gladiators; having their weapons pointing, and their eyes fixed on one another; that is, their forts, garrisons, and guns upon the frontiers of their kingdoms; and continual spies upon their neighbors; which is a posture of war. But because they uphold thereby, the industry of their subjects; there does not follow from, that misery, which accompanies the liberty of particular men.⁹

⁸ There might be cases where this isn’t true if the consequences of defection are relatively minor and the benefits of cooperation are large, but generally I take one of the reasons the prisoner’s dilemma is a *dilemma* is partly because the person who defects has good reasons for doing so.

⁹ T. Hobbes, Thomas, *Leviathan*, 96-97.

States can cooperate and act internationally in a way that is less driven by the dynamics of the PD because the greater, corporate capacities of the state make them less vulnerable to defection by the other actors in the system. In other words, it appears that the more immune the player is from retribution in these kinds of strategic games, the less the game looks like a dilemma and the stronger the obligation to cooperate.

Yet, the PIP lacks this element of mutual vulnerability. The features that make the PIP so apparently intractable are the very features that eliminate the exposure of the cooperators. Let's consider the decision to consume or conserve from the standpoint of the current generation. The extent to which previous generations have conserved or consumed the relevant resources is now fixed.¹⁰ This generation must then decide whether to consume the temporally diffuse goods to an unreasonable extent and thus whether to 'cooperate' with future generations. It might be true that any generation would like to consume resources and impose the costs of that consumption on others, but that self-interested motivation is insufficient to generate a dilemma. As we saw above, it is the element of *exposure*

¹⁰ The *fully* sequential nature of these interactions is what creates a disanalogy between the PIP and cooperative endeavors like, say, retirement insurance, *pace* Joseph Heath ("Review of Intergenerational Justice," edited by Axel Gosseries and Lukas Meyer, *Ethics*: 120 (2010), 851-855). If the costs of temporally diffuse goods are sufficiently in the future, then no person we interact with will need to pay for the consequences of *our* consumption of the good, though we may very well see the effects of consumption that came before us. In a retirement insurance scheme, we regularly interact with the individuals we support and then regularly interact with individuals that support us. We *can* be punished by later individuals if we defect and refuse to support those dependent upon us. In the *PIP*, we quite literally *cannot* be punished for defection. This is why tit-for-tat strategies are not applicable: PIP-generations do not interact in the kind of way that allows these sorts of iterative strategies to succeed.

that generates the moral complexity in standard coordination problems. In the classic examples, players must worry that when cooperating they will be disadvantaged or harmed by the defection of other players. They might spend more time in jail or lose market share. But in the intergenerational case, there does not appear to be any relevant disadvantage. The cooperate/defect dyad is not worse than cooperate/cooperate for the first player. It is true that the first or present generation will need to forego the benefits of the temporally diffuse goods, but this would be true *regardless* of what future generations do. The superior, temporal position of the present immunizes it from the claims of the future, but it also means that they can cooperate without risk of costs greater than whatever benefits they give up by cooperating. On this view, the present generation is like the dominant firm deciding whether to pollute, more or less entirely free to conserve without risking any negative consequences.

Now, one might wish to argue that if the present conserves and the future consumes, then the present's conservation is 'wasted' and that this represents a 'cost' akin to the cost paid by spurned cooperators in PDs. But this kind of cost seems fundamentally different than that facing those who find themselves in the PD or Tragedy of the Commons. In the latter cases, the preference appears to be undergirded by significant material penalties: spending one year in jail as opposed to ten years is a strong foundation for preferring defensive defection over risky cooperation. But in the PIP, what founds the preference is an anticipatory desire not to have one's cooperation wasted. Yet the current generation will never be even made *aware* of whether their cooperation is 'rewarded' and will not suffer any negative consequences for the future's potential defection. In the PIP, the current generation does not expose itself; there is—quite

literally—no difference to the current generation between a future generation’s cooperation and its defection.¹¹

This feature seems to undermine the ways in which the PIP leads to a ‘structural’ pessimism concerning the possibility of generational action on climate change. Consider the following case:

COMATOSE VICTIM: Catherine comes across the trapped, comatose body of James and she notices that he has a locked suitcase full of valuables handcuffed to his forearm. It would be easy to remove the briefcase but this would cause considerable harm to James. Catherine has no means of helping James and she has decisive moral reasons to continue on her journey. Thus, she has a choice of leaving James alone or taking his briefcase. Catherine does know, however, that other people will be travelling along this path, including less obviously virtuous individuals like Isabella.

¹¹ There are at least two ways to resist this conclusion that I don’t have time to discuss in detail. First, there might be *intergenerational* projects that later generations can undermine as a way of punishing the present generation’s defection. Similarly, we could adopt a *preference-satisfaction* account of welfare. Then, the failure of the future to act to satisfy the present’s preference that their cooperation not be wasted would make the present generation worse off even after every member died. In the first case, I do not find it likely that our intergenerational projects, especially when it comes to projects that motivate us multiple non-overlapping generations into the future, will be sufficiently robust as to derail these dynamics. Second, setting aside the obvious problems with the idea that preferences satisfied or unsatisfied could affect my welfare after I die, I am left wondering why it matters *to the present* that this *particular* preference goes unsatisfied. After all, it makes no material difference in terms of the resources available to them to lead decent lives. I don’t deny that individuals have these preferences, but I deny that the preferences in the PIP and those in the PD are of equal normative importance.

Like the PIP, this is a sequential problem; Catherine can do little to influence Isabella and Isabella can operate, essentially, with impunity. Should we describe COMATOSE VICTIM as a ‘collective action’ problem between Isabella, James, and Catherine, with similar exculpatory consequences if either Catherine or Isabella refuses to cooperate? Surely not. Rather, the real question is whether Isabella or Catherine will take advantage of their position to harm James. Of course, Catherine might *prefer* that she get the suitcase over Isabella and might prefer that both refrain from taking the suitcase above all, but it would be stretching the notion of reciprocity or coordination to say that the real issue between the two of them is whether they can form a cooperative equilibrium around taking the briefcase. After all, Catherine can refrain from violating the rights of James *without* any cost to herself. Obviously, there is the ‘risk’ that her restraint will be ‘wasted’ if Isabella does decide to take James’ suitcase, but this is not the same kind of cost facing players in standard coordination games. Isabella might be less virtuous than Catherine, and, as a result, may simply act badly. We can say the same thing about the PIP. If there is some level or rate of carbon emission that does not produce especially dangerous consequences for future generations¹², then we could say that the present generation is faced with a relatively simple choice. The next generation is prostrate before them: the contemporary may take advantage of their superior position or they may not. What the next generation might do should not concern them.¹³

¹² On the issues surrounding the idea of just emissions, see Simon Caney, “Just Emissions,” *Philosophy and Public Affairs* 40 (2012), 255-300, and Megan Blomfield, “Global Common Resources and the Just Distribution of Emission Shares,” *Journal of Political Philosophy* 21 (2013), 283-304.

¹³ This is restricted to the *intergenerational* problem; the current generation does face a substantial *intragenerational* prisoner’s dilemma when it comes to global cooperation in the face of climate change (S. Gardiner, “The Real Tragedy of

Similarly, COMATOSE VICTIM is similar to the PIP in the sense that no person has a *self-regarding* interest in cooperating. Both Catherine and Isabella can defect without suffering any negative consequences; defection by either player does not make the other player worse off, except insofar as the later player will not be able to take the valuables. In other words, the only reason for Catherine to refrain is her other-regarding preference to James well and the same is true for Isabella.

In light of this analysis, it is not clear that we should be *structurally* pessimistic in the way that Gardiner describes, at least with regards to the intergenerational case. When it comes to these collective action problems, structural pessimism is motivated by two factors. These two factors represent, at least in part, the reasons why Garrett Hardin—in his description of the tragedy of the commons—argues that these problems cannot be solved ‘technically,’ they can only be solved by changing the incentive structure each agent faces. First, as was discussed above, it seems to be quite unreasonable to demand that people be altruistic and signal their cooperation when doing so exposes them to significant cost and little potential benefit. The second reason for structural pessimism is the *selection effect* of collective action problems. The basic idea is that, in systems with a particular incentive structure, agents who act ‘irrationally’ in that context

the Commons,” 407ff and *A Perfect Moral Storm*, 104-114). The one intergenerational exception might be that if we knew for certain the future would not cooperate, there was no way to convince them otherwise, and our cooperation would make no difference to any subsequent generations beyond the second.

will be outcompeted and eventually disappear. Hardin suggests that this effect applies in the case of overpopulation:¹⁴

People vary. Confronted with appeals to limit breeding, some people will undoubtedly respond to the plea more than others. Those who have more children will produce a larger fraction of the next generation than those with more susceptible consciences. The difference will be accentuated, generation by generation.¹⁵

So, one reason we should not expect cooperation in Tragedies of the Commons is that those who do cooperate will eventually cease to populate the game as they lose out in comparison to those who act individually rationally. And this is, at least partly, why we shouldn't expect the players in the game to act differently; those that do so end up disappearing. For example, one might argue that polluting firms are selected for in our tragedy of the commons since those firms that act individually irrationally by not polluting will lose market share and eventually go bankrupt.¹⁶

Neither reason for structural pessimism applies in the PIP. The present is not vulnerable to the future. Furthermore, just as the PIP lacks the possibility of reciprocal interaction, selection is also foreclosed. All 'present' generations will possess these advantages and be in a position to decide whether to consume or

¹⁴ S. Gardiner ("The Real Tragedy of the Commons") has convincingly argued that Hardin is not correct about overpopulation in particular. I am simply using Hardin to illustrate the structure of the effect.

¹⁵ Garrett Hardin, "The Tragedy of Commons," *Science* 162 (1968), 1243-1248, at 1247.

¹⁶ Robert Nozick (*Anarchy, State, and Utopia*, (Oxford: Blackwell 1974), 18-22) describes explanations of this kind as 'invisible hand' explanations. Using his terminology, the structural pessimism in a collective action problem is based on a combination of both equilibrium and fitting processes: rational agents are likely to respond to the incentives to defect (equilibrium) and those that cooperate are likely to be removed from the dynamic over time (fitting).

conserve. Conservation does not expose the present to the possibility of losing, bankruptcy, reproductive failure, or any of the selection forces that work in these other models. So, it is not obvious that we have reason to be structurally pessimistic in the context of the intergenerational storm.¹⁷ But perhaps we should be pessimistic regardless. Perhaps it is simply too much to demand that human beings refrain from benefitting themselves when they are in such an easy position to do so; we may not be able to rely on the *other-regarding* preferences of Catherine and Isabella to not take advantage of James. And so, perhaps we should be skeptical that any generation will be so virtuous as to refrain from exploiting those subject to their power just out of the goodness of their hearts. But this is a skepticism brought about by the ability of human beings to refrain from abusing essentially absolute power; we may not be able to resist James's briefcase, but we shouldn't pretend that taking the briefcase is anything but the powerful taking what they will.

III

¹⁷ There are, at least, two sources of structural pessimism in the context of the 'The Perfect Moral Storm' of climate change that these argument leaves untouched. First, there is the problem of the *intra*-generational coordination created by the multiplicity of political actors who have strong incentives to free-ride and defect from any regime to reduce emissions. Second, even if a generation were to have a decisive preference to reduce emissions, it might still be rational to *delay* that emissions policy along the lines of the self-torturer paradox (see Chrisoula Andreou, "Environmental Damage and the Puzzle of the Self-Torturer," *Philosophy and Public Affairs* 34 (2006), 95-108). My argument is only about whether the intergenerational storm as described by the PIP should be a source of structural pessimism. I thank an anonymous reviewer for forcing me to be clearer on this point.

The Domination of Future Generations

The previous section, I suggest, motivates a *domination*-oriented account of intergenerational justice. As I suggested above, the best way to characterize the PIP is not as a collective action problem but rather as a problem of getting the present—which exists in a commanding position to do what it wishes—to stop abusing the future with its over-consumption of temporally diffuse goods. The moral imperative to avoid domination, rather than reciprocity, seems to be a more appropriate normative concept when we are dealing with the unilateral relationship between the present and the future, with the former being much more powerful than the latter. In this section, I outline a theory of intergenerational domination and argue that this is a better foundation for the analysis of intergenerational justice than reciprocity and cooperation.

‘Domination’ is a fairly flexible concept. It is often used descriptively. A game theoretic strategy is ‘strategically dominant’ when it produces a better outcome regardless of what your opponent does. On a variety of measures, a firm might achieve ‘dominance’ when it has a large enough share and influence within its market. Max Weber defined domination as the high likelihood that one’s commands will be obeyed, and feminist theorists have often equated domination to the possession of social, political, and economic power.¹⁸

However, I will use ‘domination’ to refer to a particular type of political injustice. Thus, to claim that a person has been dominated is to claim that they have been wrongfully subject to a particular kind of political power, a subjugation that is intrinsically

¹⁸ Frank Lovett (*A General Theory of Domination and Justice*, (Oxford: Oxford University Press, 2010), 1-10) has a nice introduction to the concept of domination and various theoretical attempts to grapple with it.

inimical to that individual's autonomy, freedom, or status as citizen.¹⁹ Of course, this normative sense is not unrelated to the descriptive senses mentioned above as all of the latter have in common their reliance on the idea of a superior power or superior position. Domination, on my view, occurs when an agent possesses superior power over another *and* is in a position to use that power arbitrarily. This 'arbitrariness' is *not* merely a function of the ends to which that power is put or what principle the powerful agent adopts. Rather, an agent is in a position to exercise power arbitrarily when there are no external and public mechanisms that require the powerful agent to be accountable to those over whom they wield power.²⁰ An important consequence of this view is that a dictator who is in a position to issue whatever commands they wish and see those orders carried out *necessarily* dominates regardless of whether their commands are wise or foolish, compassionate or vicious. After all, whether the common good is served depends upon the whims of a political agent with absolute power. Of course, it is, in some sense, *better* to live under the heel of a benevolent despot rather than a cruel one,

¹⁹ There is a long political and philosophical tradition of arguing that domination is the central example of political unfreedom (Philip Pettit, *Republicanism: A Theory of Freedom and Government*, (Oxford: Oxford University Press, 1997), 17-41). My view is that domination is inherently inimical to *relational-egalitarianism*; it represents a morally problematic relationship between superior and subordinate *even if* that relationship is used to benefit the subordinate (for more, see Elizabeth Anderson, "What is the Point of Equality?," *Ethics* 109 (1999): 287-337, at 312-315).

²⁰ I intend to be fairly ecumenical with this definition of 'domination,' endeavoring to remain agnostic between, for example, Pettit (*Republicanism: A Theory of Freedom and Government*, 52-58) and Bohman (James Bohman, "Children and the Rights of Citizens: Non-domination and Intergenerational Justice," *The Annals of the American Academy of Political and Social Science* 633 (2011), 128-140, at 134-135) as well as others. These disagreements about the nature of domination are important, but nothing I say in the rest of the paper depends upon adopting one conception rather than the other.

but it remains the case that no one should live under anyone's heel.

There are, ultimately, two strategies for resolving the problem of domination in a particular political context. First, one can increase the power of the subordinate or decrease the power of the superior so that there is no asymmetry; without superior power, there is no domination. The second strategy is to structure the superior power so that it is non-arbitrary. Usually, this is achieved by the development of a constitutional order that possesses significant safeguards, checks and balances, and meaningful avenues of contestation and accountability. Completely describing the various constitutional mechanisms that can be used to tame political power is beyond the scope of this essay, but I'd like to describe a particular case: the regulation of police power. In a modern constitutional democracy, law enforcement personnel have considerable power. Indeed, the modern state both came to populate the political landscape because of, and is legally defined by, its possession of essentially irresistible, superior power over its citizenry.²¹ This power has many sources: equipment, training, social status, and institutional organization. Nonetheless, law enforcement agencies do not dominate if they are reliably constrained and publicly accountable. This can be accomplished in numerous ways, but here are some

²¹ Charles Tilly (*Coercion, Capital, and European States, AD 990–1992*, (Cambridge: Wiley-Blackwell, 1992), 14-16) has argued that the reason the modern state came to achieve its primacy in the global political landscape because it was the most effective political formation for the organization of collective violence. The Montevideo Convention defines statehood in terms of the ability of a government to wield power effectively over a defined territory (Thomas Grant, "Defining Statehood: The Montevideo Convention and its Discontents," *Columbia Journal of Transnational Law* 37 (1998), 403-457, at 413-414). Iris Marion Young (*Inclusion and Democracy* (Oxford: Oxford University Press, 2000), 1-3) uses civilian review boards to demonstrate ways in which arbitrary power can be effectively restrained.

specific mechanisms: public laws that delineate the appropriate scope of police power, citizen review boards with the power to discipline police officers, an independent judiciary that can exclude evidence illegally obtained, videotaped confessions that can be evaluated by a jury, internal affairs investigators, and civil liability for wrongful death in the event of unjustified shootings. In each case, these institutions can ensure that the police serve the common good as well as setting out publicly the appropriate uses of police power and the means for addressing the abuse of that power. On this view, these safeguards and constraints are not *simply* instrumentally useful in getting police to behave properly; being subject *only* to power that is meaningfully accountable and contestable is an ineliminable element that partly *constitutes* what is to be free, to be autonomous, or to be part of a minimally just polity.

Gardiner has effectively demonstrated that the present is in a position of vastly superior power when compared to the future. The asymmetries of causal influence and dependence of interests make the future dependent on the present and give the present immense power to structure the choices available to the future. Furthermore, technological and economic developments have undermined the few *internal* checks constraining the present generation while at the same increasing their power to shape the future. In the pre-industrial past, the present generation had to be concerned with the future because caring about the future was an important way of helping the present.²² There was a convergence

²² In other words, the economic production was structured in such a way that hurting the future required hurting the present and that policies that benefitted the future benefitted the present. See my “Domination and the Ethics of Solar Radiation Management,” in *Engineering the Climate: The Ethics of Solar radiation Management*, edited by Christopher Preston (Plymouth: Lexington Books, 2012) for a more detailed discussion of this dynamic. This is similar, in certain ways, to making police officers civilly liable for the consequences of firing their

of interests. If the present ceased to care for their children, they wouldn't have caregivers when they ceased to be productive. If the present refused to care for agricultural infrastructure or burned their fields, then they would starve themselves²³. This does not mean that pre-industrial societies never exploited natural resources in a way that harmed the interests of the future, it is rather that they were more constrained by their own technological limitations and self-interest than industrial societies are. Industrialization in general and the burning of fossil fuels in particular have made two things possible. First, they have vastly increased the scope, scale, and speed of the sorts of activity that will influence the future. Second, they have made possible the exploitation of temporally diffuse goods which benefit the future by imposing costs that won't be immediately felt. As a consequence, the constraints founded on technological limitations and self-interest have been worn away. The lack of intergenerational interaction makes it impossible for there to be *external* checks on the behavior of the present. Now that these internal checks have been substantially reduced, the present is in a position to act unchecked, especially when it comes to the consumption of temporally diffuse goods. The present is now in a position to enrich themselves by causing extensive environmental damage in a sufficiently distant future that is relatively easy for them to ignore.

weapon. If every police officer faced the possibility of torts based upon wrongful death for unjustified killing, this would provide a powerful disincentive for using a weapon negligently or excessively. I have been told personally by police officers that this helps explain why some jurisdictions have larger numbers of questionable uses of force than others.

²³ These distinctions probably help partly explain why some types of environmental degradation are more easily responded to than others. Ozone layer depletion was sufficiently rapid that it directly affected the generation that began using CFCs. So, the present had a strong incentive to deal with the issue, it acted, and the ozone layer has stabilized.

Furthermore, it is clear that this power is being deployed arbitrarily. There is no constitutional order that is shared by both the present and future that could reliably constrain the power of the present. And it is equally clear that the current actions of the present—burning fossil fuels and generating climate change—will impose significant costs on the future.²⁴ What’s more, it seems that whether the present decides to do so is entirely up to the present generation, and it is hard to see how the future could demand accountability or contest the decisions of the present. In fact, the very same causal dynamics that make *reciprocity* impossible seem to make the domination especially intractable and invidious. As a result, we must conclude that the present dominates the future and then uses that dominating position to unjustly benefit itself at substantial cost to the future.²⁵

²⁴ For a thorough discussion of the implications and effects of climate change, see the Working Group II contribution to the Fourth Assessment Report of the IPCC (2007). An updated Working Group II Report will be published in March 2014:

http://www.ipcc-wg2.gov/AR5/AR5_provisional_schedule.html.

²⁵ John Nolt (“Greenhouse Gas Emission and the Domination of Posterity,” in *The Ethics of Global Climate Change*, edited by Denis Arnold, (Cambridge: Cambridge University Press, 2010) has argued that the domination of posterity is, for a variety of reasons, *especially* bad. While Nolt is interested in the domination of posterity, there are key differences between his analysis and mine. The most important of which is that Nolt argues that only domination that results in *harm* is morally problematic. As a consequence, Nolt suggests that what the present must do is to cease harming the future. Of course, I agree that the present should take steps to guarantee that future generations can lead decent lives, but I disagree that benevolent yet dominating power is morally acceptable. A benevolent despot remains a despot. As a consequence, I think a focus on *harmful* domination is much too narrow and exaggerates the moral attractiveness of policy responses like solar radiation management that block the effects of climate change without dealing with the underlying political and economic power structures (see my “Domination and the Ethics of Solar Radiation Management,” for a longer argument to that conclusion). So

Before I turn to potential objections to a domination-oriented account, I would like to present a few reasons why it is superior to accounts of intergenerational justice based upon reciprocity and cooperation. There are many such views. Some argue that we should conceive of intergenerational justice through an intergenerational veil of ignorance designed to fairly distribute the benefits of intergenerational cooperation.²⁶ Others argue that a generation that over-consumes should be conceived as ‘exploiting’ later generations as they take more than their ‘fair share’ of the collective surplus produced by intergenerational cooperation.²⁷ These views share a common notion: we should conceive of generations that are related sequentially or diachronically as a set of cooperators that are engaging in productive activity synchronically. But as Gardiner has shown, generations are *never* in a position to reciprocate the conservationist activity of the previous generation and generations simply don’t interact. Of course, it might nonetheless be true that the best way to conceptualize just relations between generations is as reciprocal cooperators despite the fact they are not, but I would like to spend the rest of this section describing a few reasons why, at the very least, reciprocity views need to be supplemented (and perhaps supplanted) by a domination-oriented view.

unlike Nolt, I am arguing the present should take steps to avoid domination regardless of whether they are using their superior power to harm the future or not. I do think, but cannot argue fully here, that only a non-dominating order will be a reliably non-harmful one.

²⁶ See David Heyd, “A Value or an Obligation? Rawls on Justice to Future Generations,” in *Intergenerational Justice*, edited by Axel Gosseries and Lukas Meyer (Oxford: Oxford University Press 2009).

²⁷ See Christopher Bertram, “Exploitation and Intergenerational Justice,” in *Intergenerational Justice*, edited by Axel Gosseries and Lukas Meyer, and Matthew Rendall, “Non-identity, Sufficiency, and Exploitation,” *Journal of Political Philosophy* 19 (2011), 229-247.

First, while the obligations of cooperation and reciprocity seem to become more specific and concrete as the level and nature of the interactions becomes more robust, domination can become more salient the ‘thinner’ the interactions between subordinate and superior. As there is less and less actual cooperation and less and less reciprocity, then our intuitive sense of what constitutes a ‘fair portion’ becomes more contested since the actual details of the interaction provide less of a guide. As a consequence, our judgments about ‘reciprocity’ become based on more abstract moral considerations and cease to be a meaningful independent guide to how we ought to act. On the other hand, as individuals interact less frequently, the risk of domination increases and the need to avoid domination becomes more urgent. The reason for this is that as individuals interact, the mechanisms for reciprocal checks and mutual negotiation grow in frequency and power. Consider two political and economic relationships.

Posca the Slave: Posca is the household servant of a rich Roman consul. He is involved in the most intimate affairs of the family. He tutors young children, manages household finances, and advises his master. He serves at the pleasure of his *dominus* and may be ordered about, sold, and disciplined at the whim of his master.

Norman the Serf: Norman owes fealty to Henry II of England, owing his land to a kingly grant. However, Norman lives in a distant part of Normandy and, for the most part, lives his life almost entirely independent of any authority except for the local manorial lord.

In both cases, the dominating agent has the ability or capacity to exercise considerable power over the person subject to them,

but Posca's closeness to his master affords him opportunities to become relatively 'indispensable' (by developing irreplaceable skills and knowledge) or to negotiate relationships that check each other (for example, making use of the affection of the son he tutored in order to protect his family from the depredations of a valued free client of the master family). These robust interactions provide opportunities for Posca to increase the costs of exercising power in ways detrimental to his interests, but they also make the exploitation of the slave's labor and skills much more intense²⁸ (that is, the more frequent and closer interactions help masters expropriate the economic product of their slaves; Posca's master gets a lot more from Posca than Henry II gets from Norman). In the king-serf case, the opposite dynamic applies. Henry II is probably not going to expropriate Norman's labor and economic product as easily and intensely as that of those with whom he regularly interacts (in fact, we could imagine certain scenarios where the king receives essentially none of the agricultural production of Norman). But nonetheless, the king is certainly in a deeply problematic political relationship with the serf even if no property is expropriated or is likely to be. And if the king *should* decide to exercise his power against the serf, the lack of prior interaction will deprive Norman of even the small possibilities of negotiation available to Posca. Given this analysis, it would seem that domination would be especially useful when discussing intergenerational justice, which represents the limit case of causal influence without reciprocity.

²⁸ It is important to note two things. First, both Posca and Norman are dominated and subject to severe injustice. Second, I am not claiming that we should *prefer* Posca's situation to Norman's. Rather, I claim that domination is an appropriate and action-guiding moral concept even in cases where infrequent economic interactions make considerations of 'reciprocity,' 'exploitation,' or 'fairness' less relevant and concrete.

Second, a domination-based analysis is oriented towards the *capabilities* of the present that make it possible for them to undermine the interests or life chances of future generations and not simply the *results* of the actions of present and past generations. In other words, if we focus fairly narrowly on the fact of cooperation or non-cooperation between generations, then we can be lulled into concluding that there is nothing morally problematic about the relationship between the generations simply because we happen to (finally) cooperate with the future by conserving temporally diffuse goods.

For example, if we focus on exploitation—defined in terms of taking more than your fair share—then one could conclude that as long as the present generation develops some mechanism for ensuring the future *receives* their fair share, the present has satisfied its obligation to the future. That is, suppose the present engages in a crash program of economic investment so that the future is sufficiently wealthy to effectively adapt to the consequences of unabated global warming: the economic investment could ensure that the future receives an equivalent compensation for the costs of consumption.²⁹ Or suppose the present deploys a series of geoengineering technologies that reduce or eliminate the costs to the future associated with the consumption of temporally diffuse goods. In those cases, it is plausible that, characterized entirely in terms of the distribution of material goods, the present has made its consumption behavior non-exploitative. But, in both cases, the relationship of domination is unresolved. Domination-oriented analyses force us to consider *why* the present is, currently, in a position to unilaterally condition the lives of the future and

29 The point is that domination provides us with a principled reason for rejecting compensatory schemes; there may be others. Compensatory strategies might depend on assumptions about the commensurability of various goods that are implausible (e.g., can we ‘compensate’ future generations being unable to observe polar bears by providing them with additional income per capita?).

motivate us to resolve or change that dynamic as much as possible. On a domination oriented account, a relationship can be morally problematic *even if* the victim benefits from it. We can readily imagine kind slaveowners and benevolent despots, and the largesse of their beneficence does not justify their dominating relationship over their slaves or subjects. So, there are two reasons why we might think that a focus on fair burden-sharing is inadequate. First, as a practical matter, it seems like that even initially fair setups will be unstable if they depend on individual virtue and ignore large power differentials. Second, it seems plausible that dominating relationships are intrinsically problematic political relationships that the provision of adequate distributive shares does not resolve. As a result, certain public policy responses to climate change might be more expensive or difficult but be morally required because they reduce intergenerational domination. Domination-oriented analyses provide principled reasons for rejecting various kinds of economic or technological responses to climate change that represent attempts by the present to rationalize or justify consumption but fail to deal with the underlying power dynamics between the present and future.³⁰

To summarize this section, I have argued that it is better to conceptualize the fundamental³¹ problem of intergenerational

³⁰ See my “Domination and the Ethics of Solar Radiation Management” on geo-engineering as an example of how domination can inform our judgments about the appropriate responses to climate change.

³¹ By ‘fundamental,’ I do not mean to say that only domination matters to intergenerational justice. It could very well be the case that a nondominating order could nonetheless impose unfair burdens and thus could be subject to moral criticism, though it is difficult to imagine a nondominating political system that was characterized by robust institutional protections of the future that then allowed systematic and egregiously unfair burden sharing. Still, a system can be nondominating yet imperfect. Rather, I mean to suggest that the elimination of domination is a necessary component of any account of

justice as the avoidance of domination of the future by the present than as intergenerational cooperation or reciprocity. There are three reasons for this. First, domination captures the dynamics of the PIP, which is marked by a distinct lack of reciprocity or cooperation. Second, while the moral relevance of cooperation and reciprocity becomes less relevant as interactions between agents become less robust, domination retains its significance even when interactions are thin, weak, and infrequent. Third, a focus on domination properly orients our concern towards the power dynamics between generations that allow for the possibility of abuse and exploitation. In the final section, I will consider what I take to be the most important objection to the view.

IV

Objections and Solutions

There appears to be an obvious problem with a domination-oriented analysis. If we conceive of intergenerational justice as cooperation and reciprocity and we understand ‘cooperation’ in terms of simply ensuring that future generations have their fair share of goods or an adequate environment, then the appropriate moral response is easy to describe. We can ‘cooperate’ by refraining from overconsumption or effectively compensating the future for our actions. In the previous section, we criticized the cooperation/reciprocity/exploitation views as being insufficient because they ignore the political relationship of domination that makes cooperation on unfair or one-sided terms possible, but

intergenerational justice and that domination plays a key material role in making other kinds of injustice feasible.

cooperation/reciprocity/exploitation views do have the advantage of providing clear and achievable prescriptions for the present. Yet, if we use a domination analysis, compensating or conserving is, by itself, insufficient. We are also required to *repair* the dominating relationship.

Unfortunately, it is not clear that it is even *possible* to structure the relationship between the present and future so that it is non-dominating. Phillip Pettit describes two basic strategies for resolving problems of political dominations but neither is obviously available in the intergenerational context. First, you can eliminate the superior position of the dominator by equalizing power between the agents. Unfortunately, this seems to be impossible in the intergenerational context. After all, as long as time travels in one direction, the present is always going to possess a superior position over the future. The causal influence and the asymmetric dependence of interests that make the future so vulnerable seem to be necessary and ineliminable features of the intergenerational context.

The second strategy seems no more promising. Pettit has argued that, even if we cannot or should not equalize power, we can reduce or eliminate domination by using a constitutional order of checks and balances to make that power non-arbitrary and accountable.³² Of course, there is no such constitutional order that mutually constrains the present and future generations. But more importantly, it does not seem even *possible* for there to be a common constitutional order between the present generation and those that come after it. Generations, I have assumed, do not robustly overlap. We can readily conceive of a constitutional order that mutually constrains agents that exist together, but it is hard to imagine an order that works for agents oriented diachronically. After all, whatever constraints we build

³² P. Pettit, *Republicanism: A Theory of Freedom and Government*, 67-68.

into a constitutional order must ultimately be adopted *by* the present generation without any interaction or accountability. How are we supposed to design institutions that make the present accountable to the future if the future will never be in a position to interact with the present? If *accountability* and *contestation* are significant elements of political non-domination, then it seems like intergenerational domination is unavoidable; the future cannot contest the actions of the present and, similarly, the present and the future cannot both exist in a shared order of accountability.³³ So, if domination is unavoidable *no matter what we do*, then it appears to be irrelevant in our practical deliberations. To put it another way, if we are necessarily despots, then we ought to concern ourselves with being *benevolent* despots rather than cruel ones. If we must dominate, then we can at least act *as if* we are engaging in reciprocal cooperation with the future even though we really are not.

This is a serious worry and, in many ways, it is similar to the objection I have laid against the cooperation/reciprocity views. Domination looks to be an inappropriate concept to apply to intergenerational justice because intergenerational relations are simply too one-sided for a focus on domination to be helpful.

Before I provide a full response, I want to point out two features of the intergenerational situation that open up the possibility of non-domination in the intergenerational context. First, we need to see that there is a distinction between *formal* power and *substantive* power. Formal power is the kind that that has been and always will be possessed by the present generation in virtue of its relationship to the future: time and causal influence flows in one direction. Formal power, then, is reflected in a kind of bare feasibility. This formal power remains constant while the present's substantive power waxes and wanes. So, it is always

³³ *Ibid.*, 61-63.

within the power of currently existing people to, for example, burn all their crops and act in ways that make the lives of future people worse off without any response from the future. Their formal power is always present, but the technological, economic, and social dimensions of the power of present people have increased in scope, magnitude, and speed while dramatically decreasing in cost. The substantive power of the present has grown because now the present's interventions often have a global effect, have more significant immediate consequences, occur more quickly and cheaply, and can often be accomplished in ways that benefit the present. As an agents *substantive* power increases, so does the intensity of the domination, but if that power decreases, so does the domination. The second element of the response is to realize that generations are, unlike states or corporations, not really agential entities. Throughout this paper, I have discussed what a 'generation' will do in the face of some incentive structure, but this is only a useful shorthand. Theorizing in terms of generations is useful because they describe a certain context and relationship that *a group* of agents, both corporate and individual, share, but we should not let that deceive into thinking that each generation is *itself* a corporate agent. This means that we can use different agents *within* a generation to check each other and develop 'pre-commitment' strategies by which those checks are structured to block harmful or unjust behavior.

With these two elements in mind, there are at least three ways we can reduce domination between generations. Combined, these three mechanisms represent the beginnings of a strategy for producing just, non-dominating relations between the present and the future. First, Pettit has argued that virtue can play a role in reducing domination as long as it takes a particular form. He says:

Does this point mean that no difference is made by the fact, if it is a fact, that the power-bearer is benign or saintly? That depends. If being benign

or saintly means that the person acknowledges that they are subject to challenge and rebuke [...] then that entails that they cannot interfere with complete impunity; they can be quoted, as it were, against themselves [...] If, on the other hand, being benign or saintly simply means that the person happens to have inclinations that do no harm to anyone else [...] then it will not entail a reduction in the domination of those who are under this person's power.³⁴

Not all personal virtues reduce domination. A political agent that is simply nice or kind or compassionate can still nonetheless be dominating since those virtues are, or can be, almost entirely private. However, if one makes a *public* commitment that serves as a vehicle of criticism and contestation, then the virtue of having a kind of integrity, of being bound to match one's behavior to one's public pronouncements can have a robust effect in reducing domination even if it is insufficient on its own. This kind of constraint or cost *is* something that can be applied to the present even if there is no interaction with the future. In other words, if the agents—corporate or individual—of the present generation can make a truly public commitment to treating the future well (perhaps through law) and if those agents either have or can be made to have the virtue of integrity, then that would go some way towards reducing domination.³⁵ By setting a public commitment, one increases the costs of working against the interests of the future, and one also provides a legal and political standard by which those who represent the future achieve uptake in the political and legal systems.

³⁴ *Ibid.*, 64.

³⁵ One possible mechanism for this kind of public commitment, though perhaps not sufficient on its own, is to incorporate counter-majoritarian environmental and fiscal protections into national constitutions. See Joerg Chet Tremmel, "Establishing Intergenerational Justice in National Constitutions," in *Handbook of Intergenerational Justice*, edited by Joerg Chet Tremmel (Cheltenham: Edward Elgar Publishing, 2006).

Second, the fact that generations are not a single agent but are rather composed of many agents provides an opportunity for these agents to check each other even if the future cannot. It is not a necessary feature of domination-oriented analyses of political liberty that the person subject to a superior power be able to *personally* contest the exercise of power as long as someone who can be reasonably construed as representing their interests does have that ability. For example, the political domination of children can be reduced by creating legal mechanisms for the protection of their interests even though children are not, even in principle, in a position to effectively contest the power of their parents.³⁶ Modern states can appoint *guardians ad litem* and have created positions within the political and legal bureaucracies that are empowered to protect children from the depredations of abusive parents. And at a more fundamental level, the very fact that the law—enforced by domestic police and paramilitary organizations—covers children and does not treat the domestic arena of the family as immune from state interference plays an important role in constraining parents, though we might think that such protections are still insufficiently robust. Similarly, we could create legal, political, and bureaucratic regimes that protect the future—and create institutional representation—that contest current policy on behalf of future generations. For example, we could require new projects and developments to file intergenerational impact reports much like we do for the environment. We could create positions where individuals would

³⁶ I am not the first to draw an analogy between the non-domination of children and the non-domination of future generations (see James Bohman, “Children and the Rights of Citizens: Non-domination and Intergenerational Justice,”), but I deploy the analogy differently. Bohman argues that the domination of children and future generations are of one piece while I want suggest that we can use the institutions we have developed to resolve our domination of children as a model for resolving our domination of the future.

be tasked with advocating for future generations in a variety of legal and political contexts.³⁷ In any case, we should be clear not to demand that responses to intergenerational domination be subject to constraints we do not accept in the intragenerational context: contestation and accountability does not need to be *personal* contestation and accountability. Police officers can protect the persons and property of individuals who are not well positioned to protect themselves, and social workers in child services can represent the interests of children who are incapable of representing themselves. Similarly, we can construct institutional mechanisms that can effectively represent the interests of the future even if the future is unable to participate. By serving as an external check and as a mechanism of contestation, these representatives and institutions help generate a kind of legal and political status for those people (i.e., future

³⁷ On the creation of environmental ombudsman, see Benedek Javor, “Institutional Protection of Succeeding Generations – Ombudsman for Future Generations in Hungary,” In *Handbook of Intergenerational Justice*, edited by Joerg Chet Tremmel. On the creation of regulatory commissions dedicated to protecting a sustainable environment, see Shlomo Shoham and Nira Lamay “Commission for Future Generations in the Knesset: Lessons Learnt,” in *Handbook of Intergenerational Justice*, edited by Joerg Chet Tremmel. Andrew Dobson (“Representative Democracy and the Environment,” in *Democracy and the Environment*, edited by William Lafferty and James Meadowcraft (Cheltenham: Edward Elgar 1996)) has argued for the creation of special parliamentary seats where environmental organizations can represent the future, while others have argued for various reforms to either strengthen the voice of the young or weaken that of the old (Philippe Van Parijs, “The Disenfranchisement of the Elderly and Other Attempts to Secure Intergenerational Justice” *Philosophy and Public Affairs* 27 (1998), 292-333). Ludvig Beckman (“Do global climate change and the interest of future generations have implications for democracy?” *Environmental Politics* 17 (2008), 610-624) presents a good summary of the various proposals. My account here has two benefits. First, it can provide a criteria for evaluating these proposals and provide a principled response for why we might constrain the democratic prerogatives of future generations, thus answering Beckman’s worry.

generations) that had previously lacked that status. And insofar as that status leads to more effective guarantees of consideration and contestability, the exercise of the power *by* the present *over* the future becomes less arbitrary.

Finally, the present generation can act to bind itself by *reducing* its substantive power over the future, thus reducing the intensity of their domination over the future. Recall that the growth of the present's substantive power is a consequence of certain developments in technology and economic organization. It is possible to decrease the domination of the future by decreasing the substantive power of the present, at least partly undoing the developments of the past few hundred years. Of course, it is vanishingly unlikely that the present generation will simply forget how to make and use industrial and postindustrial technology, but we can reduce the substantive power of the present by reducing the ease and increasing the cost of deploying particular technologies.³⁸ For example, as I have argued,³⁹ one reason to favor mitigation and adaptation strategies which attempt to reduce emissions and global warming effects over geoengineering strategies that block the effects of those emissions is that the former reduce the substantive power of the present while the latter increases it. In other words, certain kinds of economic organization rely upon, encourage, and perpetuate the over-consumption of fossil fuels. As modern economies have sunk more and more capital into the creation of transportation and production networks that rely on these fuels, a path-dependent dynamic in favor of the rapid and cheap consumption of fossil

³⁸ Rasmus Karlsson ("Reducing Asymmetries in Intergenerational Justice: Descent from Modernity or Space Industrialization?", *Organization and Environment* 19 (2006), 233-250) describes two other strategies for reducing the substantive power of the present: space exploration and colonization, and de-industrialization.

³⁹ See my "Domination and the Ethics of Solar Radiation Management."

fuels and the extensive emission of carbon has deepened and hardened. However, careful intervention into the economy in ways that favor the use of sustainable and renewable energy as well as capital investments in adaptation of the global economy in general and the developing world in particular have the potential to arrest and reverse that dynamic. If it does and transportation, production, and consumption come to rely on the provision of *sustainable* energy and practices, then capital investment and the institutional stickiness of economic organizations will work to *increase* the cost of returning to a cheap emissions equilibrium. This would reduce the substantive power of the present by increasing the costs and difficulties of using high emissions technologies. As substantive power decreases, so does the intensity and urgency of the domination.

In sum, domination-oriented analyses of intergenerational justice can provide meaningful practical advice in the reform of our political, legal, and economic institutions. In order to reduce intergenerational domination, the present will need to make a public commitment to structuring their political and legal institutions in a way that provides for the meaningful representation of the interests of the future. Furthermore, the agents of the present generation will need to restructure their economic and social institutions so that the substantive power of the present is meaningfully constrained and structured in a more sustainable direction.⁴⁰

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SYMPOSIUM
A CHANGING MORAL CLIMATE



GLOBAL WARMING AND THE PROBLEM OF
FAILED INTENTIONS

BY EVELYN BRISTER

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Global Warming and the Problem of Failed Intentions

Evelyn Brister

Abstract. Effective solutions to global warming will likely require coordinated national and international policies. But in the short term, individuals might choose to take actions or not take actions which will reduce their own contribution to global warming. Philosophers have argued that individual action to curb climate emissions is not morally inconsequential. A strong case can be made for individual causal responsibility for the production of the moral harms which would result from climate change.

However, the nature of human moral psychology is such that we can expect a lack of moral motivation to assume responsibility at the crucial moment of action. That is, moral agents face “the problem of failed intentions.” This paper assesses the moral value of specific techniques and technologies which promise to increase the ability of moral agents to fulfill their moral intentions. For instance, since individuals typically evaluate others’ actions as less moral than their own, social norming techniques which provide objective information about how one’s climate emissions compare to others can be an effective means of supporting moral action.

I

Introduction

Like many people—like you—I am concerned about the threat posed by global climate change to future societies and people. I hope that the harms which threaten to kill individual people, destroy cultural artifacts, extinguish animal and plant species, make people hot, thirsty, hungry, and miserable, and decrease global economic prosperity never come to pass. The evidence is strong that if business continues as usual and fossil fuel emissions, methane emissions, and deforestation are not reined in, human suffering, cultural devastation, and lasting environmental damage are bound to happen. I really wish—don't you?—that the governments of the world would do something.

While I bemoan political inaction, I am sitting by a portable heater, wearing a comfortable but lightweight shirt, looking at a bright screen, and wondering if, perhaps, I should also be directing blame at my own actions. What exactly are my options as an individual when it comes to reducing greenhouse gases? On the one hand, I feel that I have no options: flying to distant conferences is something I do for my work, the amount of driving I do is dictated in large part by the design of the city I live in, and were I to conserve energy and consumption as much as I possibly could, I would not then be able to invest my time in writing about climate ethics.

But I do have good intentions, of course. Like most of us, I want to act ethically and do my part to reduce climate emissions. However, I have other obligations and concerns as well, and I am not certain that living my life differently would have a meaningful effect on the total impact of climate change. What if I made a sacrifice in the name of the well-being of others, but in the complex causal chain of markets and politics and energy use, my

efforts made no difference whatsoever? And if I do have suspicions that a change in my lifestyle would cost me something meaningful but would not materially reduce future human suffering, then I am unlikely to feel the moral motivation to live my life differently. Not only that, but the intuitive moral calculus used by so many of us—professional philosophers and laypeople alike—might not reckon up so that future, distant, uncertain harms weigh more heavily in the moral balance than current discomfort and sacrifice. If I turn off the heater, I will be cold; if I turn off the computer, my work will not be completed; if I don't drive my child to swimming lessons, then that is one less life skill he will possess. It is reasonable to doubt whether these sacrifices, *my* sacrifices, are necessary, or even contributory, toward reducing global climate change

In the end, if I have reasonable doubts about the existence of my personal ethical duty to combat climate change, am unable to figure out how to fulfill the obligation (assuming it exists), or am unable to carry out this obligation when I have so many others which are more pressing, then that obligation's hold on me is quite limited. The basic ethical principle that 'ought implies can' means that I am blameworthy only if I am actually capable, given my real-life situation, of taking actions which would reduce the harms of climate change. In the case of global climate change it just isn't clear—at least to many of us—that solo, individual actions are anything more than tilting at windmills.

This common question—whether my lifestyle changes will really make a difference when the problem is global or whether, on the other hand, my efforts are too inconsequential to matter—is one that has recently received philosophical attention. If my contributions cannot be expected to make a difference, then that absolves me of the consequentialist duty to do my part toward curbing greenhouse gas emissions. In what follows, I examine this

debate and side with others who have argued that while we don't have duties as lone individuals, due to the inconsequentialist argument (taken together with practical and political realities), we do have a collective duty. The collective duty to action is usually placed onto government. While my lifestyle changes may be too inconsequential to matter, if I and my fellow citizens are successful at influencing the government to enact a policy change, the resulting drop in climate emissions would be consequential. Thus, my ethical duty to address climate change can best be fulfilled by directing my energies toward influencing my government. Unfortunately, given the political cynicism of many Americans today about the responsiveness of government to citizen demands, this tack can quickly give way to fatalism about the coming climate catastrophe. Compared to the political power of the oil and gas industries, my political powerlessness again makes my efforts seem inconsequential.

In the second half of this paper I argue that we are not in fact trapped in this double bind between inconsequentialism and cynicism. This is because there are other means of engaging in collective action. Instead of identifying the government as the sole or primary agent of collective action, I explore another way of identifying a relevant collectivity, such that the inconsequentialist conclusion need not shut down the possibility of extra-political change. I argue that, instead, we identify social networks as collectivities. Through social action (even if it is not centrally organized), communities can successfully execute actions which would be defeated by inconsequentialism if it were up to lone individuals to carry them out. Moreover, recognizing the *social* nature of our moral psychology is necessary to help us achieve such collective action. A few examples illustrate some techniques which support moral intentions by taking moral psychology and behavioral ethics into account. I conclude that when it comes to our duties with regard to reducing emissions,

the duty of educators is to educate well, the duty of policy-makers is to make effective and well-informed policy, and the duty of all individuals is to avoid moral hypocrisy as best we can. I also consider the special responsibilities philosophers, in particular, bear.

II

Inconsequentialism, Moral Mathematics, and Cynicism

The scientific evidence predicting widespread harms to people, to ecosystems, and to the built environment as a result of anthropogenic climate change is indubitable. Although we are past the point at which future harms can be avoided entirely, the degree of future harm depends on how much and how fast global warming can be controlled and the rate of climate change slowed. The more greenhouse gas emissions are reduced, the less harm will be caused,¹ and the entities which apparently possess the power to enact this sort of global change are nations. But nations have been slow to adopt policies which would reduce emissions. Despite this inaction, public awareness and concern about global warming has grown, and the rhetoric of making a “personal difference” to the problem of global warming is common in the marketing of new products and in the media. So, even if the United States, for instance, is unwilling to act, the citizens of the United States might be willing to take action as individuals. This raises two questions: can the immediate actions of individuals to curb personal greenhouse gas emissions make a difference in

¹ The effect is not linear. Feedback loops are likely to have strong effects, so quicker action will be more effective than the same action taken at a later date.

reducing future harms? And if so, do individuals therefore have a duty to act, even while the government fiddles?

Walter Sinnott-Armstrong, John Nolt, and Avram Hiller have debated whether it is morally legitimate to treat curbing emissions as the personal duty of individuals. Sinnott-Armstrong makes an argument from inconsequentialism. I am just one of billions of individuals, he argues, and my activities contribute to global greenhouse gas emissions in a thousand different ways. Out of seven billion people, the food I consume, the products I use, the miles I drive, the bulbs I burn, and the degrees I heat or cool my house have virtually no effect on the global climate. Each action I choose is *so inconsequential*, he argues, that I can't possibly be a less moral person for having decided to take a leisure drive when I might have just stayed home. To think that my own contributions, taken in isolation, can have any sort of impact is to misunderstand the scale of the problem.²

Sinnott-Armstrong has a point. For instance, just in the years since he wrote that paper, the state of North Dakota has developed new oil and gas fields using horizontal fracking techniques. These oil fields are so rich that capturing all of the natural gas they produce is not economical. As a result, 30% of the natural gas which is extracted is flared off—enough gas burnt off every day to heat half a million homes.³ Lowering the thermostat in my home by a couple of degrees accomplishes extraordinarily little compared to what would be accomplished by preventing the release of even a small percentage of the

² Walter Sinnott-Armstrong, "It's Not My Fault: Global Warming and Individual Moral Obligations," in *Perspectives on Climate Change: Science, Economics, Politics, Ethics*, edited by Walter Sinnott-Armstrong and Richard B. Howarth, (Amsterdam: Elsevier, 2005), 285-307.

³ Clifford Krauss, "In North Dakota, Flames of Wasted Natural Gas Light the Prairie," *New York Times* (Sept. 26, 2011)

greenhouse gases released in North Dakota oil fields. In this way, when we compare the real impact of various possible actions, Sinnott-Armstrong points out that it would be “better to enjoy your Sunday driving while working to change the law so as to make it illegal for you to enjoy your Sunday driving.”⁴ Thus, Sinnott-Armstrong concludes that the greatest chance of successfully controlling the rate of climate change requires us to meet our collective duty to act as a nation. Compared to what can be achieved through changes in government policies, the lone actions of individuals are too inconsequential to make a difference.⁵

John Nolt objects to Sinnott-Armstrong’s classification of personal actions as inconsequential. He uses moral mathematics to determine that, given the number of people likely to be harmed in the future by climate change, and given the number of people who benefit the most from greenhouse-causing emissions, the average American’s lifetime emissions will be responsible for the suffering or even death of a couple of people. According to his calculation, a typical American’s lifetime emissions equal, on average, one two-billionth of current and near-term emissions, and these current emissions, on one projection, could harm four billion people. Thus, a typical American harms (given averages and best estimates) the lives of one or two people.⁶ We will never

⁴ Walter Sinnott-Armstrong, “It’s Not *My* Fault: Global Warming and Individual Moral Obligations,” 304. Even changing the law so that the cost of Sunday driving reflected the real environmental cost would be worthwhile.

⁵ Steve Vanderheiden (*Atmospheric Justice: A Political Theory of Climate Change* (New York: Oxford University Press, 2008)) also argues that while governments have a responsibility to mitigate the harms of climate change, and while we have a duty to influence our democratic governments, we do not have an obligation to act as individuals as a substitute for government action.

⁶ John Nolt, “How Harmful Are the Average American’s Greenhouse Gas Emissions?,” *Ethics, Policy, and Environment* 14 (2011), 3-10.

know which people are harmed by our individual greenhouse-causing emissions, and these people may live in the future and in distant lands, but regardless of their distance from us, this harm is significant indeed. It is not a harm which I, as a decent person, would intentionally commit.

In addition, though it risks oversimplifying the moral mathematics, Avram Hiller takes this line of argument one step further: my seemingly inconsequential decision to spend an afternoon behind the wheel amounts to ruining someone's afternoon.⁷ That, too, carries moral weight.

There is at least one problem, though, with using moral mathematics to analyze individual contributions to climate change. The argument relies on an appeal to the marginal effects of my actions: on the assumption that it is *specifically* the actions which I have taken which are causally connected with harm to others. In other words, the negative outcome depends specifically on my having taken a certain action, so that if I did not perform the action, the harm would not occur. In response, Joakim Sandberg argues persuasively that the appeal to inconsequentialism on both sides of this debate, though intuitively appealing, does not accurately track moral causation.⁸ Following Sandberg's observation, if I were to take some

⁷ Avram Hiller, "Climate Change and Individual Responsibility," *The Monist* 94 (2011), 349-368.

⁸ Joakim Sandberg, "'My Emissions Make No Difference': Climate Change and the Argument from Inconsequentialism," *Environmental Ethics* 33 (2011), 229-248. Sandberg's central argument is that there is something misleading about using moral mathematics in this way. He builds on Parfit's thousand-torturer example to show that the appeal of connecting my actions with concrete harm to two future humans depends crucially on how the example is constructed. It risks committing a fallacy of division, since our intuitions would swing in a different way if we weigh the import of our contributions spread over the lives of 4 billion people.

individual actions to combat climate change—even actions that come at quite some cost to my own happiness and comfort—the causal structure of the climate change problem does not mean that I will therefore be making such an impact that some future life is incrementally better than it would otherwise be.

Sandberg shows that one problem with attempting to calculate that my actions will harm or not harm someone in the future is that in some cases my decision to reduce my carbon footprint does not wind up affecting the total amount of emissions produced. For example, when I use one of the many carbon footprint calculators available online, I find that airplane flights account for the largest percentage of my emissions. However, should I decide not to buy a ticket, the flight will take off whether I am on it or not. If I do not fly, then the emissions, though not *my* emissions, will still be put into the atmosphere.

This result can be expanded further. The greatest percentage of the emissions which are part of the calculation of future harm are not emitted by individuals at all. They are the result of government and corporate decisions and actions taken on behalf of many others. Consider the methane being burned at the site of North Dakota oil wells. If I were in a position to influence a policy which would prevent the production of this huge amount of greenhouse gas as a by-product of oil-drilling, then I would be morally blameworthy for failing to use that influence. However, once the oil is produced, and the greenhouse gases are emitted at the drilling site, someone will buy and use that oil. My participation *as a lone individual* in an economy that depends on the use of oil has little—and most likely, no—effect on the production of those molecules of gas. At best, my disengagement from the fuel economy would affect the price of oil in an infinitesimal way, but this will not necessarily reduce overall

consumption.⁹ An examination of the causal relationships which produce the greenhouse gases thus destroys the intuition about the marginal harms of emissions on which the mathematical argument depends. As Sandberg explains,

we have a *collective* obligation to change *our* ways, and this collective obligation may be partly separate from the obligations of individuals. While my own flying makes no difference, it should be noted, climate change could be averted if we all changed our ways. But then it seems plausible to say that we act wrongly as a *collective*, even though no individual driver or flyer may be doing anything wrong.¹⁰

The conclusion which proceeds from this analysis of moral causation and individual responsibility is that when our actions are considered in isolation from the actions of others, there is not a compelling argument in support of our having a moral duty to curb personal greenhouse gas emissions. At the same time, national governments, our representatives for organizing collective action, do seem to have such a duty but are not making rapid progress toward addressing the problem. The cynical result is a rationale for diffusion of responsibility and moral disengagement. That's not a desirable conclusion to reach.

⁹ If I stop driving for leisure but others do not, then my action decreases demand (an infinitesimal amount) and, in theory, affects price by making gas cheaper. Unless others are acting alongside me to change their driving habits, too, someone else will buy the gas I'm not using for the better price. Thus, there is no reason to think that total emissions will decrease just because I halt my Sunday drives. Only the collective actions of many would have the desired effect on future harms.

¹⁰ J. Sandberg, "‘My Emissions Make No Difference’: Climate Change and the Argument from Inconsequentialism," 241.

III

Moral Psychology and The Problem of Failed Intentions

At this point, it is tempting to fire up the gas-guzzler and head out for some fresh air and a long drive in the countryside. Instead, in the remainder of this paper I will identify another place to look, in addition to national governments, for motivating collective action. While I disagree with Avram Hiller that an argument can be made to support the responsibility of isolated individuals, his conclusion provides a clue for how to avoid the cynical turn. “First,” he says, “if many individuals become aware of their daily impacts and because of that awareness make changes in their practices, the benefits may add up to a very significant extent” (2011, 365). Hiller seems to have individual actions in mind here which, when taken together, produce an additive result. He is holding a model of shared responsibility for achieving our individual duties to attack this moral problem. Namely, he holds that since the responsibility for ruining a future person’s afternoon can be pinned on my present use of fossil fuels, I have a duty to avoid that moral harm by curbing my fuel use. Since we all have this duty, we should all act this responsibly, and by sharing this duty, we can avoid those future harms. However, there are problems with construing this duty as one that falls on individuals: first, because the actual causal relationships (of markets and of global warming itself) cannot be so simplified that future harms can be pinned on individual actions, and, second, because individual actions are so inconsequential that if one person, acting alone, were to make a significant lifestyle change, it would be unlikely to alter future events. Making a difference in mitigating climate change requires

not individual action but collective action, of which government action on policy is the most typical example.¹¹

However, research on the psychology of acting together with others should lead us to treat other social groups as collectivities for the sake of coordinating action to mitigate climate change. For instance, whether signing up to join a virtual community which logs carbon emissions, taking part in organized campaigns to promote mitigation actions and lobby for policy change, working with neighborhood groups and employers to devise transportation alternatives, or exchanging advice and support on social media, people with common goals are already sharing information and knowledge, monitoring each others' actions, coordinating what they do with others, and supporting each others' moral motivation. Sufficient cohesiveness to produce group action and the motivation to act with others toward emissions reductions is to be found in the fluid social interactions of everyday life. While we wait for national governments to stop fiddling and take up their clear moral duty to reduce greenhouse gas emissions, we can act collectively *with the people we know* to reduce *our* contributions to climate change. This is collective action at the scale of local communities and informal social networks.

Insights from moral psychology and the findings of behavioral ethics demonstrate that it would be very difficult indeed for

¹¹ Specific analysis of collective responsibility and climate change can be found in Tracy Isaacs, *Moral Responsibility in Collective Contexts* (New York: Oxford University Press 2011). The thesis of collective responsibility (as opposed to individual responsibility) exists in several forms. Though it continues to be contested, it solves several puzzles such as the one presented here. Frameworks for shared agency and collective responsibility can be found in Margaret Gilbert, *Sociality and Responsibility* (Lanham, MD: Rowman and Littlefield 2000) and Larry May, *Sharing Responsibility* (Chicago: University of Chicago Press 1992).

individuals, acting all alone, to meet a posited individual moral duty to reduce climate emissions. Human moral psychology tempers the degree and manner in which we could reasonably be expected to fulfill the duty that Nolt and Hiller propose. According to moral psychologists, it appears to be a fact of human moral psychology that we perceive duties to be less urgent when there is a lack of immediate perception of harm, when the harm is to people with whom we are not familiar, when there is a delay before the harm occurs, and when a change in action would not necessarily prevent the harm from occurring. In the case of greenhouse gas emissions, all of these conditions are met: the harm's causal influence is imperceptible because of the complex physical systems involved, the harm is more likely to affect people in developing countries than those in our own neighborhoods, the harm will not reach its zenith for decades, and I cannot connect with certainty any of my choices or actions, one way or another, with specific outcomes.

Thus, whatever my good intentions to pursue a conjectured duty with regard to addressing climate change, I would likely encounter what I'll call 'the problem of failed intentions.' Indeed, I *have* encountered it. For the reasons given above, I believe that we have a (collective) duty to reduce climate emissions, and one way to pursue that duty is to make lifestyle changes and to reduce our 'carbon footprint.' Try Googling "ways to go green," and you're likely to find lists of 8, 10, 11, 22, 40, or even 150 "simple," "easy," or "tiny" steps you can take to lessen your climate impact. But I will admit that after "eating smart" and "skipping the bottled water," I grow fatigued. Today the wind chill is below freezing where I live, and I don't have it in me to bike to work. Given the normal limitations in human cognitive and perceptual abilities, people are unlikely to live up to their own moral standards with regard to reducing greenhouse gas emissions. If we take these characteristics of human moral

psychology to be inevitable, or typical, or excusable, then we will conclude that, if ought implies can, and if humans cannot be expected to overcome their psychological limitations, then we need not feel the force of an “ought” when it comes to taking the trouble to address climate change.

Thus, there are two significant problems that arise for ordinary people who are wondering about their role in protecting the future of our planet—maybe not you, but surely some people you know—people who are basically good but are a little cynical, a little jaded, and leading lives full of various commitments. First, individual actions to counter global warming appear to be inconsequential. Second, our government, which could be effective, fails to act, so that cynicism and pessimism are reinforced. Moreover, any lingering hesitation people might have must overcome the realization that, among the many pressing concerns they face, this one would likely lose to competing motivations.

However, this double dose of cynicism and pessimism is unwarranted; it can be resolved by facing the challenge of climate change *together*, with our friends and acquaintances, to create communities of action. Not only is individual action on climate change inconsequential, attempting to address the problem as a lone individual ignores the social psychological mechanisms which support resolve and, through social interaction, collective action. While I can’t do much, if anything, *by myself* to counteract global warming, I can do something positive, together with others, to organize collective endeavors, lobby for local policy changes, create and adopt well-designed technologies, and anticipate the support that we must give each other in order to make changes which will, collectively, be consequential. While there are many guides about how to reduce energy use, less emphasis is placed on the social support that is required to

provide the moral motivation to use those guides. Many of us do not realize that the support we need is at this higher level—the level of building supportive communities and developing approaches to form collectivities—rather than at the level of knowing how to install a smart thermostat. An awareness of the problem of failed intentions and an understanding of the specific cognitive limitations of human psychology can allow us to design technologies, policies, and pedagogies of moral education to help us avoid that problem and *collectively* achieve our best moral intentions. The role of educators and philosophers is not limited to the highest level of elucidating normative frameworks; it is also instrumental at the intermediate level of providing moral strategies to achieve our good intentions.

Social-psychological research has revealed the mechanisms which generate the problem of failed intentions and which pave the way for moral hypocrisy. First, when we predict how we will react in the face of a difficult moral decision, we make predictions which line up with our highest moral aspirations. We routinely forecast that we will act boldly, driven by principled, selfless reasons. Numerous experiments in social psychology show, however, that in the moment we are less likely to take a morally principled stand than we predict. In a morally challenging situation where a stand for the greater good requires a degree of self-sacrifice, most people will find a way to rationalize ignoring their principles.¹² In making a prediction about the morality of

¹² Max Bazerman and Ann Tenbrunsel, *Blind Spots: Why We Fail to Do What's Right and What to Do about It* (Princeton: Princeton University Press 2011), ch. 4. Like the social psychologists who perform the experimental work, I am not here passing judgment on the weakness of the human moral will. This description of predictable human behavior can be used to judge what can be expected of human behavior, to justify realistic expectations on moral behavior, to shape moral education, and to inform designs for social situations that will be more likely to counteract the problem of failed intentions.

our behavior, we are also likely to underestimate competing commitments and to underestimate the time and resources that moral action will require. For instance, I have agreed to attend a meeting tonight to decide on the annual goals for a park restoration project, a cause to which I am strongly committed. However, in making that commitment I did not take into account that I would have very little time with my infant daughter during the day today, or that my spouse has a project due tomorrow and will require assistance with childcare. I have good intentions to participate on the conservation project, but I also have good intentions to provide care and support for my family. Moreover, when it comes to acting to fulfill long-term goals, we often experience “ethical fading.” In the moment of action, the pressure of an earlier decision to do some unpleasant but important task can seem considerably less urgent than hunger, fatigue, simpler but less important projects, or the need to simply finish the work at hand, whether it meets our earlier standards or not.¹³

Second, social psychologists have shown that although the morality of our actions is unlikely to line up with our principled predictions, we are unlikely to notice or be bothered by our own moral failings. This tendency preserves self-respect but makes hypocrisy more likely. Valdesolo and DeSteno showed that experimental subjects pass moral judgment equally on themselves and others when their minds are otherwise occupied.¹⁴ That is, under conditions of “cognitive loading” while being kept busy by a difficult mental task, we pass judgment fairly on ourselves and others. The cognitive effort prevents revisionary judgment of our

¹³ Ibid.

¹⁴ Piercarlo Valdesolo and David DeSteno, “The Duality of Virtue: Deconstructing the Moral Hypocrite,” *Journal of Experimental Psychology* 44 (2008), 1334-1338.

own actions. However, given time to formulate additional rationalizations, subjects develop harsher judgments of others' moral actions and generate justifications for moderating their own self-judgments. Although this mechanism may protect the ego from paralyzing self-criticism, it skews moral judgment and diminishes motivation to achieve intended moral goals.

These psychological tendencies do not show that it is impossible to live up to moral intentions; they do show how difficult it is. They also provide clues for improving our self-understanding and anticipating the conditions under which we have a stronger or weaker will. In order to achieve the greatest impact through non-governmental collective actions, we should be prepared to study and utilize every available trick to methodically support each other.

IV

Behavioral Ethics and Collective Action

Fortunately, in addition to these observations about moral psychology which might make us cynical about human moral capacities, behavioral ethics reveals forms of moral reasoning which counteract this tendency toward failed intentions and that can therefore be exploited to reinforce our will to achieve moral goals. Because most of these techniques operate by triggering social impulses, they can be viewed as ways to enhance the moral behavior of communities. Even though we suffer from the problem of failed intentions as individuals, we may be better able to achieve our moral goals by acting in concert with others.

This paper began with a series of common complaints (excuses, perhaps?) for inaction in the face of global warming. We

suffer from uncertainty about what to do, uncertainty about whether what we do matters, and uncertainty about how it matters. We feel unprepared to answer these questions on our own, and this uncertainty can provide exactly the conditions under which moral hypocrisy and failed intentions occur. Research in behavioral ethics has begun to illuminate the conditions in which good intentions can be triggered and weakness of will overcome. Broadly speaking, there are three ways in which we can make use of findings in moral psychology and behavioral ethics to act collectively toward emissions reductions and attempt to overcome the phenomenon of failed intentions. *Intentional technologies* may be designed to make use of moral techniques to increase compliance with emissions reduction goals. *Moral education* may enhance awareness of moral commitments and techniques for achieving them. *Moral research* by philosophers, psychologists, and other social scientists and humanists may help us to overcome moral timidity, avoid hypocritical judgments, and accurately evaluate the weight of our moral duties. I will discuss each of these in turn. Though none of these techniques is new, research which combines ethical and philosophical engagement with social scientific evaluation of empirical results promises to increase these techniques' effectiveness at producing moral motivation.

The category of *intentional technologies* encompasses devices, architectures, practices, policies, and means of communication which can enable us to align how we *intend* to behave with how we *actually* behave when confronted with moral choices. Technologies can function by helping us to anticipate and prepare for ethical fading. That is, they can help us keep our moral commitments in mind even while confronting other pressures. Research has shown that these technologies can provide us with exactly the information we need to make a choice which will achieve a moral goal, thereby avoiding the paralyzing resignation

that is common when we are daunted by having too much or too little information.¹⁵

For instance, smart meters provide residential electricity consumers with better information about their energy usage, allowing people the opportunity to better control the amount of energy they use. One of the ways that smart meters are most effective is in reinforcing the idea that consumers have control over their energy use, and thus can be conscious of the choices they make. The Energy Orb, a sphere which glows different colors based on the variable price of electricity, provides real-time information about the cost of electricity to residential consumers in an intuitive and accessible form. One study of users of this technology found that they reduced their electricity consumption during peak periods by 40%.¹⁶ Likewise, cars such as the Toyota Prius provide drivers with information about their gas consumption so that they have the information they need to drive more efficiently. Although drivers may already know that driving slower is more efficient, the visible display acts as a reminder of that goal during the time when they are able to act on it, thus counteracting ethical fading.

Intentional technologies can also function by preventing the asymmetrical judgments about others' moral failings and our own moral justifications which give rise to hypocrisy. For instance, websites and apps can make use of social norming, which allows users to compare their own lifestyle choices or energy consumption to others like themselves. Social norming campaigns have been useful in counteracting misperceptions about others'

¹⁵ Richard Thaler and Cass Sunstein, *Nudge: Improving Decisions about Health, Wealth, and Happiness* (New Haven: Yale University Press, 2008).

¹⁶ Clive Thompson, "Desktop Orb Could Reform Energy Hogs," *Wired* 15 (2008), http://www.wired.com/techbiz/people/magazine/15-08/st_thompson.

behavior and can thus lead to more accurate assessments of one's own behavior relative to a social norm. The social media which are currently popular tools for generating social support for goals such as weight loss (the so-called "Twitter diet") could also be directed at a goal such as emissions reductions. When people make a public pledge, they are more likely to keep their goal in mind at the time of action or to take the viewpoint of an external observer who would judge them for moral hypocrisy. Communication technologies can exert an effect on the last stage of moral action, when actors look back at what they have done and recollect their actions with an unrealistic rosy glow. We misremember our actions as having met our moral goals and selectively forget cases of failed intentions. This selective memory phenomenon can be countered using data tracking to show people exactly how their own actions compare with others or with their own expressed intentions.

Moral education is a classic means of counteracting moral hypocrisy. In its contemporary form, moral education includes critical thinking and ethical reasoning techniques and curricula as well as education in moral psychology. Moral education, and ethics education, is a particular area where the training and tools of philosophers can make a difference in supporting collective action to curb climate change. One arena for ethics education is the college classroom and the university lecture hall. While scientists are accustomed to the idea of outreach activities, such as speaking to middle school students about the value of studying science, or speaking to various academic and non-academic audiences about the soundness of evolutionary theory or the empirical support for climate change, philosophers and ethicists are not as aware of opportunities to bring their areas of expertise into the public eye. In addition, ethical relativism (perhaps as a remnant of postmodernism) can be surprisingly common on university campuses. I found myself in such a situation not too

long ago, when a committee containing representatives from across campus organized a day of classes and public lectures on the topic of global warming. After inviting several keynote speakers, someone on the committee suggested that education about global warming would be incomplete without providing equal representation to climate skeptics. Only I and one other professor opposed this on the grounds that it misrepresented knowledge and that it appealed to a warped sense of ethical fairness. Discussions with committee members after this episode demonstrated to me that even though most agreed that the scientific evidence left no room for skepticism and that a climate change denier could only make a case based on false representation of scientific findings, they nonetheless believed that the open-minded thing to do was to include all views in this campus forum. However, when the issue was framed in moral and social terms, such as whether it would be acceptable to invite a racist to share the stage during a Martin Luther King, Jr. day program or a Holocaust denier to speak at a Holocaust memorial event, no one would acknowledge that this would be acceptable. Moral education and increased visibility for ethical reasoning on college campuses can help counteract moral timidity and provide opportunities to practice moral reasoning.

Philosophers are accustomed to thinking of their work as excavating difficult insights and constructing intricate, precise arguments regarding normative duties, metaphysics, causation, and so on. Communicating with our fellow philosophers about these topics is certainly a central task for the profession. While continuing with that work, we should not lose sight of our public role supporting critical thinking among non-philosophers. To that end, it is important to be sufficiently aware of moral psychology to understand how people excuse themselves from participating in ethical action and why people resist the more technical arguments that philosophers devise concerning the nature of our

moral responsibilities. The public is eager for philosophical reflection but often find philosophical research inaccessible; the public philosophy movement has accomplished much in devising suggestions for philosophical outreach.¹⁷

Finally, *research* in ethics, moral psychology, social psychology, and sociology can support collective action to counteract global warming. Research in behavioral ethics can evaluate whether the technologies listed earlier can maintain long-term effectiveness. Unfortunately, even when a technology seems justified by a good rationale, it can fail to achieve its purpose in practice. An example of a paradoxical result in behavioral ethics is the finding that under some circumstances, explicit incentives for a desired ethical behavior can actually inhibit that behavior. For instance, if a financial incentive is coupled with a desired behavior, then the financial incentive can displace the internal desire to act out of a sense of what is right, and the behavior, which may have been justified by an ethical calculation, may not seem as justified when assessed by a cost-benefit calculation.

Research in social psychology has also found that in some contexts people attempt to maintain a moral equilibrium, so that if they have acted in a way that counts as especially virtuous, they will grant themselves license to act less virtuously in a corresponding situation. This finding deserves special attention when it comes to implementing intentional technologies because it threatens to undermine the overall beneficial effects of personal reductions in climate emissions. For instance, someone might believe that turning down the thermostat a degree has produced an overall reduction in climate emissions, thus offering a moral license to indulge in a hot bath. One perceived sacrifice can seem to justify another indulgence, but this diminishes the effectiveness

¹⁷ The American Philosophical Association convenes a Committee on Public Philosophy, <http://www.publicphilosophy.org>.

of the initial sacrifice. Psychological research suggests that there are ways to counteract this tendency, for instance by adjusting moral expectations upwards over time. Social interactions can support gradually raising standards by allowing comparisons with what other people are doing. Thus, rather than comparing what we are doing now with what we used to do, by getting a realistic picture of social norms, we can find out that our sacrifice is not out of line with what others do. If we are engaged in a community of like-minded people, all of us committed to reducing global warming, then social norms can support a community which is changing its lifestyle over time.

Finally, philosophers can contribute to the social endeavor to address climate change by developing research projects which are tied to resolving the real aspects of this global problem. Ethics research, for example, can point to effective arguments and normative frameworks for evaluating actions with regard to climate change.¹⁸ We should also question whether the incentives in our profession are arranged so as to produce research that is effective in achieving insights into the moral aspects of climate change. How do we judge research that has practical implications, such as research in applied ethics? Is it judged as highly as more theoretical papers, such as in contemporary metaphysics? Are we rewarded for taking unexpected and less supportable positions—playing the climate change skeptic, for example—because they are philosophically interesting and because we value the challenge of playing devil’s advocate? Do we hold ourselves to a standard of sincerity and of responsible inquiry? Do we value taking

¹⁸ Sandler’s article (Ronald Sandler, “Ethical Theory and the Problem of Inconsequentialism: Why Environmental Ethicists Should be Virtue-Oriented Ethicists.” *Journal of Agricultural and Environmental Ethics* 23 (2010), 167-183.) is one such example of an approach which addresses the problem of inconsequentialism by outlining how virtue ethics can respond to it. There are many, many others.

intellectual risks? Do we form collaborations with researchers outside of philosophy to make better use of our intellectual capital?

Several arguments undermine the existence of individual moral duties to address climate change. But there is a collective duty that nations have not been willing to shoulder, thus prompting the challenge to conceive of social collectives and to analyze how people can act together to shoulder collective responsibilities in a way that encompasses rather loose forms of social cohesion. In the absence of an organizing authority, rather than succumb to cynicism we can learn from moral psychology how to spur collective action in informal communities in order to counteract the problem of failed intentions. (We can further hope that in democratic nations with representative governments, the initiation of widespread social action to mitigate greenhouse gas production might contribute to national policy action.) Research in moral psychology can provide the theoretical foundation for strategies and concrete steps that both allow us to shoulder our collective duty and, given what we know about social psychology, have a good shot at success. For instance, behavioral ethics reveals that humans are influenced by social factors such as how they appear to others when making moral decisions. Knowing this, we can make our decisions public in ways that will support our good intentions and help us achieve moral consistency and integrity. Further, in our professional role as educators and scholars, philosophers are well-positioned to raise moral awareness of climate change in the communities where we live, work, and teach. In sum, findings in moral psychology can be paired with techniques for enhancing the achievement of moral goals when, as in the case of curbing greenhouse gas emissions, the outcomes of moral decision-making are abstract and distant

from the perception of individuals, but are urgent and compelling nonetheless.¹⁹

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¹⁹ I profited from numerous conversations with Melissa Ziankoski, who provided the initial motivation to explore this topic. David Suits and two anonymous reviewers helped me to refine, focus, and better express the ideas presented in this article.

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SYMPOSIUM
A CHANGING CLIMATE



BRIDGING THE EMISSIONS GAP:
A PLEA FOR TAKING UP THE SLACK

BY ANNE SCHWENKENBECHER

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Bridging The Emissions Gap: A Plea For Taking Up The Slack

Anne Schwenkenbecher

Abstract. With the existing commitments to climate change mitigation, global warming is likely to exceed 2°C and to trigger irreversible and harmful threshold effects. The difference between the reductions necessary to keep the 2°C limit and those reductions countries have currently committed to is called the ‘emissions gap’. I argue that capable states not only have a moral duty to make voluntary contributions to bridge that gap, but that complying states ought to make up for the failures of some other states to comply with this duty. While defecting or doing less than one’s fair share can be a good move in certain circumstances, it would be morally wrong in this situation. In order to bridge the emissions gap, willing states ought to take up the slack left by others. The paper will reject the unfairness-objection, namely that it is wrong to require agents to take on additional costs to discharge duties that are not primarily theirs. Sometimes what is morally right is simply unfair.

I

Introduction

With the existing unconditional commitments to climate change mitigation, global warming is likely to exceed 2°C¹. It is widely agreed that global warming beyond 2°C will have very harmful consequences and that constraining temperature increases within these limits is desirable. The difference between the greenhouse gas (GHG) emission reductions necessary to keep the 2°C limit and those reductions countries have currently committed to is called the ‘emissions gap.’² Bridging this gap is considered technologically and economically feasible by leading experts.³ In order to avert global warming beyond 2°C and its harmful consequences countries must reduce emissions beyond their current commitments *before* a global climate treaty is in place in 2020. Delaying comprehensive mitigation measures until past 2020 will make it unlikely that that threshold can be met.⁴ In

¹ United Nations Environment Programme – UNEP 2011, “Bridging the Emissions Gap Report,”

http://www.unep.org/publications/ebooks/bridgingemissionsgap/Portals/24168/01_introduction.pdf;

Kornelis Blok, Niklas Höhne, Kees van der Leun, and Nicholas Harrison, “Bridging the Greenhouse-gas Emissions Gap,” *Nature Climate Change* 2 (2012), 471–474.

² UNEP 2011.

³ Ibid.; Nicholas Stern, “Stern Review on the Economics of Climate Change,” 2006,

http://webarchive.nationalarchives.gov.uk/+http://www.hm-treasury.gov.uk/media/4/3/Executive_Summary.pdf.

⁴ UNEP 2011. One of the risks of delaying action is the so-called ‘lock-in of high-carbon infrastructure’, i.e. choosing emission-intense pathways now that cannot be easily altered in the future. Furthermore, several studies show that mitigation now is less costly economically than mitigation at a later stage (UNEP 2011, N. Stern, “Stern Review on the Economics of Climate Change,”).

short, in order to limit global warming to 2°C we must close the emissions gap and we must do so as soon as possible.⁵

In this paper, I approach the problem of the emissions gap as a problem of partial compliance with a collective moral obligation. I argue that not only is there a moral duty to mitigate climate change and reduce GHG emissions in the long run, but there is a moral duty to bridge the emissions gap as soon as possible, before the year 2020. Currently, there is insufficient compliance with such a duty by capable states. I argue that—given the existing levels of non-compliance and the urgency of the problem—capable states ought to make greater emission reductions than they would have under conditions of ideal compliance.

I will start out by outlining the nature of the problem (II). In part (III) I will argue that defecting or doing less than one's fair share can be a good move in certain circumstances, but not in this situation. Part (IV) demonstrates how in some cases of partial compliance agents are required to take up the slack by others and how the emissions gap is one of those cases. Part (V) will reject the unfairness-objection to my argument, namely that it is wrong to require agents to take on additional costs to discharge duties that are not primarily theirs. Fairness should be restored in the long run though.

⁵ See also Henry Shue, "Responsibility to Future Generations and the Technological Transition," in *Perspectives on Climate Change*, 5 (2005), 265–283 and "Deadly Delays, Saving Opportunities: Creating a More Dangerous World?" in *Climate Ethics*. (Oxford: Oxford University Press, 2010).

II

The Problem

Scientists agree widely that the global climate is warming, that human activity contributes significantly to this process, and that depending on the degree of warming the change of the climate is very likely to have highly undesirable consequences. Some of the very likely effects of climatic change will be an increase in extreme weather events (floods, storms), sea-level rise and the forfeiture of coastal regions or of entire islands and archipelagos, and the melting of the polar ice caps.⁶ From a moral point of view, adapting to its unavoidable consequences is not enough, mitigating of climate change in order to limit its negative consequences is also morally mandatory.⁷ The earlier action is taken to mitigate global warming, the better.⁸

Currently, there is no binding global agreement on climate change mitigation and GHG (greenhouse gas) emission reductions. The Kyoto Protocol, which entered into force in 2005, specified emission reduction targets and mechanisms and Annex B countries⁹ committed themselves to reducing their

⁶ IPCC 2007. *Fourth Assessment Report*. Available at: <http://www.ipcc.ch/>

⁷ See i.e. H. Shue, "Face Reality? After You! A Call for Leadership on Climate Change," *Ethics & International Affairs* 25 (2011), 17-26, at 19; Steve Vanderheiden, "Globalizing Responsibility for Climate Change," *Ethics & International Affairs* 25 (2011), 65-84, at 68.

⁸ See for example IPCC report, summary, p. 66, see also UNEP 2011 and UNEP 2012, "The Emissions Gap Report 2012. A UNEP Synthesis Report," http://www.unep.org/gc/gc27/docs/UNEP_ANNUAL_REPORT_2012.pdf

⁹ These include the 15 member countries of the European Union in 1997, Bulgaria, Czech Republic, Estonia, Latvia, Liechtenstein, Lithuania, Monaco, Romania, Slovakia, Slovenia, Switzerland, U.S., Canada, Hungary, Japan, Poland, Croatia, New Zealand, Russian Federation, Ukraine, Norway, Australia, Iceland.

greenhouse gas emissions on average by 6 to 8% below 1990 levels between the years 2008–2012. But not all Annex B (or high emitting) countries have ratified the Protocol (most prominently the U.S. has not) and the agreement ran out in 2012. In 2011, finally, the parties to the United Nations Framework Convention on Climate Change (UNFCCC) agreed to negotiate a binding global treaty in 2015, which will not enter into force before 2020 though.

The reasons why a binding treaty has not yet been achieved are—to an extent—owed to political tactics and strategy, but they also result from profound disagreement on some theoretical premises—namely the principle(s) of justice which an international treaty should accommodate. And indeed there are numerous approaches to burden-sharing in the context of climate change.¹⁰ However, whatever principle one adheres to, it is clear that industrialized countries will have to take on the major part of the burden with the major issues of disagreement being how much newly industrialized countries such as China should contribute and how to integrate climate justice with wider questions of global justice and development.

The problem is that delaying substantial action until after a binding treaty is in place, i.e. after 2020, is likely to jeopardize the goal of limiting temperature increase by a maximum of 2°C.¹¹ Emission reductions countries have currently committed to make it unlikely that we remain within the 2°C limit. In the United Nations Environment Program's 2012 Emissions Gap Report, the size of the emissions gap was calculated at 8-13 Gt CO₂e

¹⁰ See e.g. Simon Caney, "Just Emissions," *Philosophy & Public Affairs* 40 (2012), 255-300; Edward A. Page, "Distributing the burdens of climate change," *Environmental Politics* 17 (2008): 556-575; H. Shue "Face Reality? After You!?" A Call for Leadership on Climate Change."

¹¹ UNEP 2011.

(carbon dioxide equivalent). This means that total annual emissions must be lowered by that amount until 2020 in addition to current reductions if there is to be a good chance of remaining within the 2°C limit. States would have to make greater emission reductions before 2020 than those they have currently committed to. Which state(s) could take on the burden of reducing emissions by 8-13 Gt CO₂e until 2020? I am assuming here that the gap cannot be closed by a single state (at an acceptable cost) but only by the collective endeavour of several states. The states that qualify as contributors to that endeavour are states with the capacity to reduce their emissions significantly, namely economically powerful and technologically advanced states.¹²

Collectively, capable states pertaining to this group are not contributing anything close to what it takes to achieve that goal at the moment. Reducing collective emissions to the extent necessary for bridging the emissions gap is collectively possible. However, it is not happening, partly because no single state wants to be at a comparative disadvantage from radically reducing its emissions while others keep polluting. The voluntary mitigation pledges of many capable states are conditional upon other states' mitigation pledges. But does the reluctance of other states to contribute to bridging the emissions gap let capable states morally off the hook? Are they not required to contribute to substantial emission reductions while others do not do so either?

¹² 'Capable' states here means states with enough emission reduction potential. The duty to bridge the emissions gap is foremost a duty of large polluters and technically advanced countries. See UNEP 2011 and Kornelis Blok, Niklas Höhne, Kees van der Leun, and Nicholas Harrison, "Bridging the Greenhouse-gas Emissions Gap," *Nature Climate Change* 2 (2012), 471–474. The capacity to reduce emissions substantially might be seen as a minimum condition for having a duty to contribute to closing the emissions gap, with historical responsibility and benefitting from climate change being further criteria to determine the duty-bearers.

Under non-ideal conditions like the ones prevalent now, willing states have roughly three options for acting: they can either (a) contribute less than what their “ideal fair share” would be, (b) contribute their “ideal fair share”, or (c) contribute more than their “ideal fair share”. But what is meant by an “ideal fair share”? An ideal fair share would be the fair share of a collective burden under ideal compliance. A fair burden-sharing scheme on climate change regulates climate change mitigation, adaptation and compensation distributes related burdens fairly among the world’s nations.¹³ It would, for instance, fairly allocate emission rights, specifying how many tons of carbon dioxide equivalent (CO₂e) each state is allowed to produce within a certain period of time. Under conditions of ideal compliance each state limits its emissions to a prescribed amount. The ideal fair share is what each state would have to contribute to mitigation if all other states (or a sufficiently large number of them) complied with their mitigation duties, too.

Advocates of option (a) would argue that states have no moral duty to take on their ideal fair share of emission reductions while non-ideal conditions prevail, that is, if or as long as other states do not discharge their duty either. According to option (b), states are morally required to reduce their emissions by the amount that is fair under ideal conditions, regardless of whether or not others comply with their duty. I will argue for option (c): Given the circumstances, capable states are morally required to do more than their ideal fair share. This means that they ought to take up

¹³ In addition to arguing for a “holist“ approach that integrates climate change mitigation, adaptation and compensation Simon Caney advocates treating climate responsibilities in conjunction with considerations about global and intergenerational justice (Simon Caney, “Just Emissions,” 299). Treating the latter in isolation with the former would run contrary to UNFCCC and not secure the agreement of developing countries and would likely result in deadlock or ineffective deal (Ibid., 279).

some of the slack left by the defectors, i.e. some of the defectors' ideal fair share. Willing states can take up the slack by reducing their emissions below the level of what an ideal fair share would demand or by assisting other states reduce their emissions. Let me first turn to option (a) and why it is wrong in the current circumstances.

III Against Defecting

One of the countries with the highest per capita emissions in the world—Australia—has currently made the following voluntary commitment to emission reductions:

Australia will unconditionally reduce its emissions by 5 per cent compared with 2000 levels by 2020.

Australia will reduce its emissions “by up to 15 per cent by 2020 if there is a global agreement that falls short of securing atmospheric stabilisation at 450 ppm CO₂-eq under which major developing economies commit to substantially restraining their emissions and advanced economies take on commitments comparable to Australia’s.

[I]f the world agrees to an ambitious global deal capable of stabilising levels of GHGs in the atmosphere at 450 ppm (parts per million) carbon dioxide equivalent (CO₂-eq) or lower” “Australia will reduce its greenhouse gas (GHG) emissions by 25 per cent compared with 2000 levels by 2020.¹⁴

¹⁴ Australian Government. Department of Climate Change and Energy Efficiency, 2012, “Fact Sheet: Australia’s Emissions Reduction Targets,” <http://www.climatechange.gov.au/en/government/reduce/national-targets/~media/government/reduce/NationalTarget-Factsheet-20111201-PDF.pdf>.

Australia's unconditional target falls way short of what Australia's fair share of emission reductions would be under perfect compliance.¹⁵ Its more ambitious mitigation targets are conditional upon the mitigation commitments of other states. Basically, the attitude reflected by these targets is this: Australia will not contribute (anything close to) its fair share to climate change mitigation unless and until others do their fair shares too. (The EU's target, though more ambitious, is similarly conditional upon the contributions of others).¹⁶

Is this attitude warranted? Could Australia (and other countries) argue that in the current situation states are not required to contribute their fair share to climate change mitigation, let alone more than their fair share? Under what circumstances is an agent justified in doing less than his fair share in a situation of partial compliance? In the following, let me briefly describe how 'defecting', or refusing to do one's fair share (or merely refusing to contribute, in the case that there is no pre-defined 'share') can sometimes be a good thing in contexts requiring cooperation.

¹⁵ For one example of a burden-allocation scheme see WBGU (German Advisory Council for Climate Change), 2009, *Special Report: Solving the climate dilemma: the budget approach*,

<http://www.wbgu.de/en/publications/special-reports/special-report-2009/>.

¹⁶ "By 2020, the EU has committed itself to: reducing its greenhouse-gas emissions by 20% (or even 30% in case an international agreement is reached that commits other countries in a similar way)."

http://ec.europa.eu/research/energy/eu/policy/energy-and-climate-policy/index_en.htm.

Many other countries have made similar commitments: Japan has a conditional target of 25%, New Zealand of 10-20% and Norway even of 40% emission reductions compared to 1990 levels should there be a comprehensive global agreement on emission reductions past 2012.

http://unfccc.int/meetings/copenhagen_dec_2009/items/5264.php.

Although defecting drives levels of cooperation down in the short term, it can drive them up in the long term. A player's retraction of his cooperation in a context where it is possible to make clear that the retraction is a punishment, rather than a first-order defection, can show others that there is no gain from defecting themselves, or from trying to take advantage of others. Making one's own cooperation conditional on others' is a way to signal an 'all or nothing' outcome: either the public good is obtained fairly, or it is not obtained at all. So long as the benefit of obtaining the desired good is worth more to a player than the benefit associated with her own defection, she will cooperate in circumstances where she believes that the conditionality of others' contributions is sincere. Sanctioning those who would put one at a comparative disadvantage is a positive means to discouraging unfair behaviour in future contexts.¹⁷ In sum, defecting or refusing to contribute to a collective good can be the right thing if it motivates others to contribute and if it ensures fair cooperation.

But defecting or refusing to contribute can also be a bad move, namely in cases where it jeopardizes a morally important good. It can inspire others to defect too as it triggers people's aversion to exploitation and to ending up comparatively disadvantaged. This, in fact, seems to be one of the obstacles to far-reaching voluntary mitigation efforts prior to a binding global treaty: with a few exceptions, no country wants to end up at a comparative disadvantage. To the extent that defecting provides others with a reason to defect too, defecting may well be immoral depending on what is at stake. Global warming beyond 2°C is likely to have far-reaching negative consequences and it will harm many people. It seems fair to think that a capable agent's refusal

¹⁷ I owe many of the ideas in this paragraph to Holly Lawford-Smith.

to take unilateral action is morally wrong if what is at stake is of such great moral significance and if it looks very likely that one's own refusal, instead of motivating others to contribute on fair terms, will merely result in their continuing failure to contribute. This is especially true if at the same time unilateral or oligolateral action is likely to have positive effects on the desired outcome and possibly motivate others to contribute too. Several countries have made their more ambitious mitigation targets conditional upon a comprehensive global climate agreement. Japan, New Zealand, Norway and the European Union (and many others) have committed themselves to substantial emission reductions if other countries make similar commitments in the context of a binding treaty. *Their willingness* to make these substantial contributions depends on the *willingness of other countries* to make similar contributions. Clearly, then, one country's mitigation commitment has an impact on other countries' mitigation commitments.

For the sake of clarity, let me contrast this situation with a similar, yet distinct, scenario. Sometimes, an agent's *ability* to make a significant contribution to a collective outcome depends on whether or not others make their contribution to that outcome. This is the case when a number of agents need to work together in order to perform an action. We sometimes speak of agents holding duties to act collectively.¹⁸ In some of these cases, agents' individual contributions will not make a difference to the overall outcome unless all (or a substantially high number of)

¹⁸ See Elizabeth Cripps, "Climate Change, Collective Harm and Legitimate Coercion," *Critical Review of International Social and Political Philosophy* 14 (2011), 171–193; Holly Lawford-Smith, "The Feasibility of Collectives' Actions," *Australasian Journal of Philosophy* 90 (2012), 453–467; Anne Schwenkenbecher, "Joint Duties and Global Moral Obligations," *Ratio* 26 (2013), 310–328; Bill Wringe, "Needs, Rights, and Collective Obligations," *Royal Institute of Philosophy Supplement* 80 (2005), 187–208.

agents contribute to it. Just imagine a situation where it takes four persons to lift a heavy armoire and only three people are present and it is clear that their combined effort will not suffice for lifting that armoire. If these facts are known to them then there is no point in them trying to lift it anyway.¹⁹ If a lot is at stake (if, for example, a person is being crushed by that armoire) the three persons still have a duty to remedy the situation somehow, but they have no duty to lift their corner of the armoire. In such threshold-cases individual contributions to a collective outcome are in vain if an insufficient number of persons contribute.²⁰

However, reducing GHG emissions is not a threshold-case: all individual efforts incrementally contribute to the collective outcome. If nothing any willing country did in order to bridge the emissions gap would have a significant effect, then it might be morally right for them to invest in adaptation only. But a willing country can be a difference-maker with respect to climate change mitigation. Individual states' contributions may globally impact emission reductions in numerous ways:

1. There is the direct impact on reducing GHG. If large economies and therewith big polluters such as the U.S. or China took the lead in emission reductions this would positively impact overall GHG concentrations.²¹

¹⁹ For a similar example see H. Lawford-Smith, "The Feasibility of Collectives' Actions."

²⁰ *Ibid.*

²¹ This formulation, however, is not entirely accurate: any reduction in GHG now will only have a delayed effect on the level of GHG accumulated in the atmosphere and an indirect impact on global warming and climate change. What we are talking about when talking about mitigation and GHG emission reductions are stabilization targets—namely levels at which it is desirable to stabilize GHG concentration in the atmosphere. The higher GHG levels in the atmosphere, the higher, roughly speaking, is the degree of global warming.

2. Emitters that are technologically advanced can make essential contributions to developing green technologies. Renewable or green technologies make mitigation more feasible.

3. Perhaps most importantly, there is the impact individual countries' actions may have on the political level. As mentioned above, substantial unilateral emission reductions are a significant step towards creating the conditions which are necessary for implementing ambitious global mitigation targets. It means to assure other countries of one's willingness to step up to one's duty, therewith warranting that they honour their conditional commitments. Given that several key countries' more ambitious mitigation commitments are conditional upon other countries' mitigation commitments, any key country which substantially reduces emissions domestically increases the chance that other countries implement more ambitious targets, too.

4. Unilateral mitigation—even by small economies and emitters—may be of symbolic value and serve as an example for the achievability of a low emission lifestyle. It deprives politicians of arguments for insisting on the economic or logistic or other impossibility or cost intensity of taking mitigation measures now. It makes it easier for other countries to follow down the same path. The more influential a country in the international political sphere the larger this indirect impact may be, while yet—again—even smaller countries and economies may well serve as a positive and inspiring example.

However, the impact of emission reductions on the concentration of GHG in the atmosphere and on the degree of warming depends on several other environmental factors too.

In sum, defecting can be morally acceptable if contributing to a joint goal or collective outcome is pointless due to the other agents' refusal to contribute or if it is likely to secure fair cooperation in the long run. None of these seem to apply to the collective endeavor of bridging the emissions gap. With the existing gap in emission reductions a lot is at stake. A willing country's contribution to the problem can make a difference to the outcome. Hence, there are strong moral reasons for it to contribute regardless of what other countries are doing; the mere fact that one country is unwilling to do its share is no reason for other countries to refuse to do theirs.

IV

Taking Up the Slack in Situations of Partial Compliance

In this section, I will defend the view that—with regard to the emissions gap—capable countries have a moral obligation to shoulder *more* than what their fair share would be if everyone else complied. Compliant and capable countries should take up part of the slack left by non-compliant capable countries—at least in the short run and within the limits of their capacity.

In what situations is an agent morally obliged to take up the slack left by some other agent(s)? To begin with, there are some cases where an obligation to take up the slack left by others is uncontroversial. If the additional burden is negligible or reasonably low while the expected gains are high, agents ought to do take up the slack even if this (slightly) exceeds their fair share of burdens. However, the emissions gap constitutes a different and more ambiguous scenario. Taking up the slack by reducing emissions substantially—possibly to zero—until 2020 is costly.

The expected gains from individual states' mitigation efforts *can* make a decisive difference to whether or not the emissions gap is being bridged, but no individual state can produce that outcome with certainty. Bridging the emissions gap, hence, appears to be no uncontroversial case and additional arguments are needed to show why taking up the slack in this case is morally obligatory.

I argue that the combination of two criteria—the situation being an injustice and it being irreversible—strengthens the argument for taking up the mitigation slack. In my view, the failure to bridge the emissions gap would constitute a particularly severe moral failure precisely because it combines these two features: it would be a *major injustice* committed against future generations which is very likely *irreversible*.²² The actions we take—or refuse to take—now will once and for all determine the minimum level of global warming and how bad the consequences will be for those who live later.²³

As to the first criterion, climate change may well be a case in which the non-provision of a collective good or outcome constitutes an injustice, violating the rights of the prospective

²² David Miller thinks that these are two factors that may impact on our judgment of non-compliance cases. While he ultimately argues that in the case of climate change mitigation polluters have a so-called “humanitarian obligation” to take up the slack, he does not consider this obligation to be a stringent, enforceable moral duty. According to Miller, it gives complying agents good reasons to take up the slack, but they may not legitimately be forced to do more than their fair share. David Miller, “Taking Up the Slack? Responsibility and Justice in Situations of Partial Compliance,” in *Responsibility and Distributive Justice*, edited by Carl Knight and Zofia Stemplowska (Oxford: Oxford University Press, 2011), 230-245, at 243ff.

²³ H. Shue, “Responsibility to Future Generations and the Technological Transition.”

victims and imposing avoidable harm onto them.²⁴ Who are those prospective victims? Future generations in all parts of the world will be affected. However, most affected now and in the future will be those who have the least means to adapt to a changing climate and protect themselves against the consequences of global warming. The poorest happen to be also the ones who least contributed to the problem of climate change. Without far-reaching action to limit global warming and to help those who are unjustly affected by it, emitting GHG will become (or—for that matter—continue to be) a cynical redistribution mechanism: those who are well-off will be living at the expense of those who are not yet born and those who are least well-off.

Some have argued that the idea of committing an injustice towards future generations is problematic, because duties owed to future persons are not owed to anyone in particular. The intuition that acts can only be bad if they are bad for someone has first been comprehensively discussed by Derek Parfit.²⁵ Moreover, the identity of future persons seems to depend on acts in the present and past.²⁶ Climate change could then be said to harm no one as those suffering from its consequences in the future would not have existed or would have had different identities had the past been different, for example, had the world taken action on climate change mitigation before. This is part of what is called the ‘non-identity problem’:

²⁴ See also D. Miller, “Taking Up the Slack? Responsibility and Justice in Situations of Partial Compliance,” 236. For arguments from collective harm see E. Cripps, “Climate Change, Collective Harm and Legitimate Coercion.”

²⁵ Derek Parfit, *Reasons and Persons* (Oxford: Clarendon Press, 1987), 363.

²⁶ *Ibid.*

Put simply, the puzzle is that actions or social policies that will lower future quality of life will harm few, if any, members of future generations because they are also necessary conditions of these people coming into existence.²⁷

I will not go into this problem here, which has been discussed in detail elsewhere.²⁸ I believe that the non-identity problem does not seriously affect the argument that current generations have duties to mitigate climate change. According to Henry Shue,

[i]f one has any responsibilities to human beings whose interests one can significantly affect, then one has these responsibilities to any such human beings who happen to live in future times, whatever their numbers and identities.²⁹

This takes us to the second feature that a failure to bridge the emissions gap would have: reversibility of non-compliance. Failing to act in time is making a choice that determines how bad climate change becomes at its worst. Shue argued that

The irretrievability of lost historical opportunities matters in this case because the opportunity that is now being lost is to prevent climate change from becoming as extreme as it will otherwise probably become.” And

²⁷ E. A. Page, “Distributing the burdens of climate change,” 132.

²⁸ The literature on the non-identity problem is extensive. For a discussion of possible solution to the puzzle see for instance Matthew Hanser, “Harming Future People,” *Philosophy & Public Affairs* 19 (1990): 47–70; Jeffrey Reiman, “Being Fair to Future People: The Non-Identity Problem in the Original Position,” *Philosophy & Public Affairs* 35 (2007), 69–92; Rivka Weinberg, “Identifying and Dissolving the Non-Identity Problem,” *Philosophical Studies* 137 (2008), 3–18.

²⁹ H. Shue, “Responsibility to Future Generations and the Technological Transition,” 271. On the moral aspects of the intergenerational dimension of climate change see also Stephen Gardiner, *A Perfect Moral Storm: The Ethical Tragedy of Climate Change* (Oxford: Oxford University Press, 2011), 144ff.

“our failure might well set the bottom limit on how bad things finally become.”³⁰

If the decision by non-compliers is reversible, compliers can choose between taking up the slack and getting non-compliers to contribute.³¹ If their decision is non-reversible, compliers can only choose between taking up the slack or not. The problem with climate change mitigation is that even if current non-compliers can be brought back into compliance at a later stage, this will not fully avert the harm. That is, the effect of later emission reductions will not be equivalent to that of prompt reductions and future adaptation is not morally *en par* with swift mitigation. No matter how much we spend on adaptation, it will not avert the (additional) extreme weather events and natural disasters to come. It will only put us in a better position to deal with them.

The longer capable agents hesitate to take voluntary action while waiting for others to do their share, the less the position of non-compliers becomes reversible.³² The longer one hesitates to reduce GHG, the higher is the likely future concentration of GHG in the atmosphere.³³ Not only will countries have to go to substantially greater lengths later in order to mitigate global warming. It means something worse than that: whatever is done at a later stage will—most likely—be insufficient for limiting global warming to 2°C—a temperature increase which will very

³⁰ H. Shue, “Responsibility to Future Generations and the Technological Transition,” 279.

³¹ D. Miller, “Taking Up the Slack? Responsibility and Justice in Situations of Partial Compliance,” 237.

³² See for instance H. Shue, “Responsibility to Future Generations and the Technological Transition”; Nicholas Stern, “Stern Review on the Economics of Climate Change.”

³³ See the different mitigation scenarios by UNEP 2011.

likely trigger irreversible threshold effects.³⁴ The decision to contribute to climate change mitigation is certainly reversible, but the consequences of deciding against taking substantive (additional) emission reductions now are not. Mitigating climate change now is not equivalent to action taken later. It is in this sense that the decision to not reduce GHG *now* is not reversible.

Under the prevailing circumstances, complying agents only have the choice between taking up (some of) the slack left by others or not. Out of these two options, complying agents have very strong reasons to choose the first: to take up (some of) the slack. The harm that they can possibly avert would amount to a major injustice and it is urgent enough to warrant immediate action. To wait until (all) other countries contribute their fair shares is presumably counterproductive. Above all it is large economies and powerful countries that can have a significant influence on whether or not we will be able to mitigate enough in time.

V

The Objection From Unfairness

My argument triggers the following objection: One might argue that it is wrong to require agents to take up the slack of emission reductions because it is unfair. There are two versions of this argument: first, the argument from comparative unfairness; second, the argument from non-comparative unfairness.³⁵ David Miller formulates the first unfairness objection as follows:

³⁴ UNEP 2011 and UNEP 2012.

³⁵ Sabine Hohl and Dominic Roser, “Stepping in for the Polluters? Climate Justice Under Partial Compliance.” *Analyse & Kritik* 33 (2011), 477–500.

Someone who contributes but refuses to take up the slack might defend herself by pointing out that she is doing her fair share and that to do more would put her at an unfair disadvantage relative to others (indeed at a double disadvantage relative to the non-compliers).³⁶

However, as Sabine Hohl and Dominic Roser as well as David Miller point out, this objection is implausible. If being put at a relative disadvantage was a good enough reason to defect then this reason would not only apply to situations in which an agent takes up the slack left by others, but also to situations in which he does his fair share while others defect. As such, the argument from comparative unfairness would—if taken seriously—provide an agent with a reason to defect whenever others do.³⁷

According to the second and more plausible version of the unfairness argument, it is unfair to impose costs on someone for discharging a duty that is not his duty in the first place. Hohl and Roser call this the “*extra burden interpretation*” of the unfairness

³⁶ D. Miller, “Taking Up the Slack? Responsibility and Justice in Situations of Partial Compliance,” 236.

³⁷ Henry Shue—in his 2011 article “Face Reality? After You!? A Call for Leadership on Climate Change”—argues that this insistence on a principle of comparative fairness really just covers up that fact that some countries are not even doing their minimum share: “Both sides tend to defend their bargaining position as representing nothing worse than an insistence on not doing more than one’s fair share until others have done their fair share [...]. But this is an inaccurate characterization of the situation for the United States as well as for a number of other parties. It is one thing to refuse to do more than one’s own fair share until others have done, or have agreed to do, at least their fair share. However, it is an entirely different matter to refuse to do even one’s own share [...] until others have done or have agreed to do so as well” H. Shue, “Face Reality? After You!? A Call for Leadership on Climate Change,” 22-23). Shue thinks that wealthy countries should contribute the equivalent of this share even if the other countries do not. He adds that with an insistence on justice (“I will only give in if you do”) wealthy countries have deadlocked the debated in some kind of a catch 22: they have perverted justice into paralysis (Ibid., 23).

involved in taking up the slack”.³⁸ It is not the relative disadvantage of the agent taking up the slack compared to the relative advantage of the defector that account for the unfairness in the above described situations, but the fact that the compliers are burdened “with extra costs that they would not have had to bear if everyone had fulfilled their responsibility.”³⁹

How can one respond to the second version of the unfairness argument? One could argue that requiring agents to take up the slack is often unfair, but that there are situations in which what is morally right is simply unfair. Fairness is always a morally relevant concern, but it is not always an overriding consideration. It may be overridden as a reason against a particular distribution of burdens if danger is imminent and the non-provision of the good is irreversible. This is provided that the unfairness imposed on the complying agent does not exceed the unfairness imposed on the victim of the original injustice⁴⁰. In the case of bridging the emissions gap, does that appear to be the case?

Let us briefly look at the burdens imposed on those who take up the slack. Reducing emissions beyond what one’s fair share will—in the short run—impose relatively high costs on a state and therewith on its citizens and residents⁴¹. Measures such as substituting fossil-fuel based energy with renewable energy, replacing cars with combustion engines with electric cars, improving energy efficiency, etc. require high upfront investment

³⁸ S. Hohl and D. Roser, “Stepping in for the Polluters? Climate Justice Under Partial Compliance,” 484.

³⁹ Ibid.

⁴⁰ Fairness seems to become more important the greater the disadvantage suffered by the over-complier.

⁴¹ According to Zero Carbon Australia, the costs for transforming Australia’s stationary energy sector into a zero carbon energy sector are \$37 billion for the duration of 10 years, or “the equivalent of a stimulus to the economy of 3% of GDP.” Zero Carbon Australia, Stationary Energy Plan 2010, *Synopsis*, 17.

costs. Economic incentive mechanisms such as an emissions-trading scheme or a carbon tax may lead to domestic energy price increases which again are likely to increase domestic production costs and make a country's products less competitive on an international market. This could have effects on domestic employment, salaries, job security, etc. which would impact on individual citizens' well-being.

However, it is not that clear that mitigation measures beyond a country's fair share will be only costly while producing no further benefits. Blok *et al.* who examine 21 initiatives that would trigger GHG emission reductions of around 10 Gt CO₂e argue that these initiatives would also “generate significant ‘green growth’ benefits, stimulating economic development based on environmentally sound solutions.”⁴² On a global level, the economic benefits of early mitigation are palpable: according to economist Nicolas Stern:

Using the results from formal economic models, the Review [The Economics of Climate Change] estimates that if we don't act, the overall costs and risks of climate change will be equivalent to losing at least 5% of global GDP each year, now and forever. If a wider range of risks and impacts is taken into account, the estimates of damage could rise to 20% of GDP or more. In contrast, the costs of action—reducing greenhouse gas emissions to avoid the worst impacts of climate change—can be limited to around 1% of global GDP each year.⁴³

At the moment, the countries which invest early in renewable energies have the double advantage of being able to export technology and expertise to other countries now and in the future, and of becoming increasingly independent of finite natural

⁴² K. Blok, N. Höhne, K. van der Leun and N. Harrison, “Bridging the Greenhouse-gas Emissions Gap,” 1.

⁴³ N. Stern, “Stern Review on the Economics of Climate Change,” Summary of Conclusions.

oil and gas resources. Furthermore, there are local health benefits from replacing conventional fossil-fuel based technologies that often generate significant air, soil and water pollution with clean energy. Smart solutions, local energy infrastructure and governance may counterbalance a lot of the burden of investment into renewable energies. In sum, taking on additional mitigation burdens in the sense of transforming one's economy into a low-emission or zero-emission economy on a faster rate involves significant costs for that state, but it is not clear that these costs are necessarily overly demanding or else burden these economies beyond acceptable limits. Eventually, all states have to reduce their emissions to zero or close to zero. States that take up the slack would merely do so faster and hence have a higher upfront investment and possibly—but not necessarily—a less smooth transition to a low-carbon or zero-carbon economy. In sum, the unfairness from taking up the slack of emission reductions does not necessarily exceed the unfairness towards future victims of climate change.

In contrast, continuing to drive climatic change poses an injustice against those who will suffer its consequences through no fault of their own. These consequences will very likely affect the wellbeing of millions of people in the future and are already affecting a large number of people in the present. Some of the likely impacts of global warming beyond 2°C will be very destructive.⁴⁴ These harmful consequences are—to some degree—avoidable, yet those in a position (and under an obligation) to prevent them refuse to act.

Provided sensible mitigation policies are implemented, the injustice against the victims of climate change probably exceeds most countries' costs of doing more than their ideal fair share of emission reductions. In each individual case, however, this would

⁴⁴ IPCC 2007.

depend on the scope of any particular country's mitigation contribution relative to its capacity to mitigate. Hohl and Roser argue that there are at least some countries which have the capacity to mitigate beyond what their fair share would be under ideal conditions.⁴⁵ For these countries, taking up the slack would not be overly demanding. Moreover, and this is especially true for large emitters, their emission reductions beyond what is their fair share can contribute significantly to averting the catastrophic consequences of global warming in the future.

Finally, let me turn to another version of the unfairness-objection, paralleling an argument brought forward by Liam Murphy in his book *Moral Demands in Nonideal Theory*.⁴⁶ Murphy develops the 'collective principle of beneficence' according to which, when it comes to benefiting others "each agent is required to sacrifice only as much as will make it no longer true that his level of expected well-being is higher than it would be under full compliance."⁴⁷ Murphy holds that a person need never contribute more to a collective endeavour (aimed at bettering the lives of others) than she would have to under full compliance but within the constraint that she do as much good as possible.⁴⁸ I cannot fully rehearse his argument here, but while Murphy admits that the "collective principle of beneficence leaves the victims of non-compliance worse-off than they would be if the compliers took up (some of) the slack,"⁴⁹ he nevertheless thinks that an increased

⁴⁵ S. Hohl and D. Roser, "Stepping in for the Polluters? Climate Justice Under Partial Compliance."

⁴⁶ Liam B Murphy, *Moral Demands in Nonideal Theory* (New York: Oxford University Press 2003).

⁴⁷ *Ibid.*, 86.

⁴⁸ *Ibid.*, 86-97.

⁴⁹ *Ibid.*, 92.

need for beneficence due to other agents' non-compliance does not increase the level of required sacrifice for complying agents.⁵⁰

Applying this argument to the case of emission reductions, one could thence reject a duty to take on more than one's ideal fair share of climate change mitigation because it requires complying agents to assume responsibilities that are not theirs. And indeed, it seems counterintuitive that complying agents who do not take up the slack left by others act wrongly just in the same way that non-compliers act wrongly. After all, the defecting agents should be the ones to blame.

However, there are a few problems with this objection. Let me make two points to that extent. Firstly, I doubt that the scenario that Murphy sketches is morally equivalent to the problem of the emissions gap. There is a difference between what is morally mandatory in one-off (emergency) situations and what is morally mandatory in recurring situations or with regard to persistent moral problems. The question of the requirements of a duty of beneficence, as Murphy tackles it, makes most sense as a question about what is morally mandatory in the long run, with regard to a persistent problem or a recurring situation. It may not be the right question about what one ought to do in a one-off situation. And, in fact, when Murphy applies the principle of beneficence that he proposes to an emergency situation this produces highly counterintuitive results.⁵¹ The *urgent* necessity to bridge the

⁵⁰ Ibid., 125.

⁵¹ Murphy examines the following challenge to the collective principle: "If we have two potential rescuers and two drowning children, but one rescuer fails to do her share, doesn't the good rescuer have to rescue both children?". L.B. Murphy, *Moral Demands in Nonideal Theory*, 127. He agrees that needs that arise in emergency situations are not treated specially by the collective principle. He argues that in cases where two children are drowning in a shallow pond and two potential rescuers are present, with one refusing to do his share, saving the second child too is not the willing rescuer's moral duty: "[A] person inclined to

emissions gap *now* in order to ensure that global warming remains below 2°C constitutes a type of emergency because the window of opportunity for averting highly undesirable outcomes is closing and the consequences of delaying action are likely to be irreversible. The question of what any individual state ought to do *now* needs to be answered differently from the question of how states ought to act (and distribute mitigation burdens) *in the long run*. While considerations of fairness in distribution should have great weight in long term arrangements, they may have less weight in exceptional situations and emergencies.

Second, the duty to mitigate climate change is not a duty of beneficence. Arguably, it arises from a duty not to harm which many would hold to be more stringent than a duty of beneficence. Emitting GHGs can be considered a harmful activity. Even if individual emissions are not harmful in isolation, the aggregation of emissions can be seen as (a type of collective) harm.⁵² I will not argue for the harmful character of emissions here, as it has been discussed in much detail elsewhere.⁵³

rescue the first child would very likely also be strongly inclined to rescue the second. In doing so, she may act beyond the call of duty, but she acts on motives she ought not to try to rid herself of.” (Ibid., 132) He attributes our strong intuitions about having to save both children to a negative emotional reaction to the character of a person who fails to do so: “It seems plausible to think that our strong negative reaction to failures to rescue is based not so much on a sense that the agent acted terribly wrongly but on a sense that his emotional indifference to the victim’s plight shows him to have an appalling character.” (Ibid., 133).

⁵² Walter Sinnott-Armstrong, “It’s Not My Fault: Global Warming And Individual Moral Obligations,” in *Perspectives on climate change*, edited by Walter Sinnott-Armstrong and Richard Howarth, (New York: Elsevier 2005), 293–315.

⁵³ John Broome, *Climate Matters: Ethics in a Warming World* (New York: Norton, 2012); E. Cripps, “Climate Change, Collective Harm and Legitimate Coercion”; James Garvey, *The Ethics of Climate Change: Right and Wrong in a*

Fairness is an important criterion for determining how we should distribute burdens in collective endeavours, but it does not have lexical priority. It is *a* reason against taking up the slack in situations of partial compliance, but it is not always an overriding reason. However, having established that considerations of fairness do not deliver strong reasons for refusing to take up the slack does not mean to drop them altogether. Rather, given the urgency of the problem, they are temporarily deferred. Taking on additional burdens at a certain moment in time may qualify an agent for compensation or a corresponding burden-relief in the future. In the long run, all countries must reduce their emissions to (close to) zero. States that mitigate more now may be allowed to mitigate more slowly in the future while their total emissions remain the same or else they could be compensated for the emissions they did not produce or be relieved from part of their adaptation burden. Defecting states acquire a *pro tanto* obligation to restore fairness later and to compensate willing agents. Some may argue that subsequently restoring fairness and recovering some of the additional mitigation costs will not be feasible or likely. True, but what follows from this? Such considerations have implications for a state's capacity to reduce emissions beyond its ideal fair share, but not for its obligation to take on extra burdens within the limits of its capacity.

Warming World (London: Continuum 2008); Anne Schwenkenbecher, "Is there an obligation to reduce one's individual carbon footprint?" *Critical Review of International Social and Political Philosophy* 17 (2014), 168-188; Henry Shue, "Responsibility to Future Generations and the Technological Transition"; Peter Singer, "Climate Change as an Ethical Issue," in Moss: *Climate Change and Social Justice*, (Carlton, VIC: Melbourne University Publishing, 2009), 38-50 and "One Atmosphere," in Stephen Gardiner, Simon Caney, Dale Jamieson and Henry Shue, *Climate Ethics: Essential Readings* (Oxford: Oxford University Press 2010).

VI

Conclusion

I have argued that given the current emissions gap capable states should voluntarily reduce their GHG emissions beyond what their fair share of emission reductions would be under ideal conditions regardless of whether other states do the same, but with a view to motivating them to follow in the same path. Taking on a greater burden *now* entitles states to compensation later. More powerful states will be in a better position to recover their (additional) costs from defecting states, which means that they have even less justification to refuse to do more than their fair share now. But even if taking up the slack is unfair towards the willing slack takers in the long run, it is the morally right thing to do in the current situation. Furthermore, the greater a state's economic and technological capacity to reduce its emissions, the greater its duty to take on mitigation burdens beyond its ideal fair share.

There are a number of problems that the discussion in this article relates to, but that could not be given much attention. One question is how the present argument relates to the problem of adaptation. Generally speaking, prevention of harm should have priority over adapting to harm or compensating for it. If we can avoid harm at a reasonable cost we should do so rather than impose it on others and then help them adapt to it. While present and future adaptation costs for existing and non-avoidable future harm are inevitable we should not give up mitigation in favour of adaptation.⁵⁴

⁵⁴ See also H. Shue, "Face Reality? After You! A Call for Leadership on Climate Change," 19; Steve Vanderheiden, "Globalizing Responsibility for Climate Change," 68.

Furthermore, the present article did not discuss mitigation obligations of agents other than states. Undoubtedly, states are best positioned to make a significant difference to global emissions through adopting domestic legislation to that effect, funding research on and development of renewable energy technologies, or by being a global leader on climate change. Yet, individual citizens, corporations, and other collective entities capable of taking action on climate change are not off the hook. Arguably, if states do not comply with their mitigation duties domestic and supranational collective agents and, ultimately, individuals are the next duty-bearers in line.⁵⁵

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⁵⁵ See also E. Cripps, "Climate Change, Collective Harm and Legitimate Coercion"; Anne Schwenkenbecher, "Is there an obligation to reduce one's individual carbon footprint?". The possibility of multi-level action on climate change has been discussed i.e. by Elinor Ostrom in "Polycentric systems for coping with collective action and global environmental change," *Global Environmental Change* 20 (2010), 550–557.

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