Milan Ilnyckyj
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Climate change and democratic legitimacy

A child born in 2012 will be middle-aged in mid-century and can hope to live until 2090 or beyond. Based on modern estimates of climate sensitivity and business-as-usual greenhouse gas (GHG) emission scenarios, it seems likely that these children will live to see dramatic climatic changes gaining force through their lifetimes, including steadily rising sea levels, the increasing incidence and severity of extreme weather events, and major changes in patterns of weather and precipitation globally. Furthermore, it seems likely that these consequences will endure for centuries or millennia after these GHGs are originally emitted. The normative and political significance of this has not yet been well integrated into political theory or the practice of democratic politics.

The power of democratic governments over individuals is primarily justified by the claim that these governments represent the preferences or interests of the populations they govern. The modern democratic perspective has resulted from an evolution in the notion of who is part of the polity, with political franchise gradually expanding from a narrow set of property-owning males to include the poor, members of racial minorities, and women.[1] While the argument that popular consent legitimates the use of power by governments is generally convincing, it runs into problems when we consider choices with irreversible long-term impacts, as well as those involving catastrophic risks. Because climate change involves both of these phenomena, it is worth considering whether the consent of the population alive and voting today is sufficient

[1] Stephen Gardiner draws a direct parallel between the problem of the 'tyranny of the majority' in democratic societies and our ongoing dismissal of the interests of future generations, in relation to climate change. Stephen Mark Gardiner, A perfect moral storm : the ethical tragedy of climate change (New York: Oxford University Press, 2011). p. 143

justification for the important and irreversible choices that are being made now in relation to energy and climate change - choices that will have a substantial effect on the lives of human beings living for thousands of years. The interests of these individuals are not represented in the current political system, raising the danger that we will impose large costs and risks upon them in exchange for relatively trivial present-day benefits. If we accept the possibility that these people are appropriate subjects for moral consideration, it may follow that we are unjustly imposing costs and risks upon them. There are also additional lines of argument in the climate ethics literature that suggest that members of future generations are being ill-treated and that the democratic justification for our current choices is unsatisfying. If these claims are accepted, it makes sense to consider ways in which the interests of future generations can be better incorporated into the political systems of democratic states, either through institutional means or by calling on individual voters to alter their behaviour - particularly the way in which they engage with the political system.

This paper will do four things. It will describe key elements of the scientific consensus on the causes and probable consequences of anthropogenic climate change. It will also examine the emerging climate ethics literature to determine what normative implications arise from climate science. After considering the relevance of these normative implications to the legitimacy of democratic governments, it will propose two general pathways to a more inclusive democratic politics that better takes into account the rights and interests of those in future generations. One option is to incorporate these rights and interests into the institutions of democratic states - for instance, by creating powerful individuals or organizations charged with defending them. Alternatively, individual citizens in democratic states can be called upon to make choices that take into account more than just their own immediate interests. Individual voters may have an

obligation to behave non-psychopathically toward members of future generations, and it may be possible to find some way to drive them to take that obligation seriously.[2]

This paper will focus on the normative politics of climate change from a human-centric point of view, in which the key ethical questions concern the impact of today's choices on human beings in the mid-to-distant future. This is not meant to exclude the possibility that there may be important normative obligations related to non-human animals or the rest of nature. Scientific assessments have highlighted the danger that climate change could disrupt the intricate relationships between species that constitute ecosystems, particularly when climate change takes place alongside continuing habitat destruction and other forms of human disruption of the rest of nature.[3] Given that plants and non-human animals have a lesser ability to adapt intelligently to changing climatic conditions, it seems fair to say that whatever the strength of the moral case for preventing dangerous climate change for the benefit of human beings, this case becomes somewhat stronger when the interests of other species are given consideration as well. Also, it is worth noting the reality that human life is dependent upon the Earth's biological systems. As a result, the protection of non-human nature can indirectly serve human ends.

What is democratic legitimacy?

To begin with, it is necessary to establish a preliminary notion of what 'democratic legitimacy' means in the context of governmental decisions on climate and energy policy. While this question will be engaged with in greater detail below, it is worth noting to begin with that there are two quite different mechanisms by which legitimacy can be evaluated: in terms of the

[2] By 'psychopathic' behaviour, I mean behaviour that ignores the rights and interests of all parties other than those making the choice. Psychopathy is characterized by the absence of empathy and the willingness to use other people as means for advancing personal ends, even when such usage is harmful to them.

[3] See, for instance: Stephen J. Thackeray, et al, "Trophic level asynchrony in rates of phenological change for marine, freshwater and terrestrial environments," Global Change Biology 16.12 (2010): 3304-13,.

variously-informed and self-interested judgment of citizens at the time when the decisions are made, and in terms of the idealized perspective of observers with full information about the consequences of choices and who are able to abstract their own interests from their judgment. In some cases, the judgment of the populace at the time of decision may accord well with a well-informed and dispassionate assessment undertaken by disinterested outsiders. In cases where the two assessments diverge substantially, it is worth considering whether this reflects a conflict of interest between the current generation - which stands to benefit substantially through continued unlimited fossil fuel use, and which will likely not suffer the worst effects of climate change - and future generations who gain nothing from our vacation flights to Hawaii and propane-fuelled patio heaters, but who may as a result of such extravagances find themselves in a world of ever-rising oceans and dangerously unpredictable weather.

In order to develop an adequate conception of what legitimacy means in this context, we must consider some of the most salient features of climate science and the emerging climate ethics literature. I will now examine each in turn.

Climate science

Even summarizing the extant climate change science far exceeds the scope of this analysis. That said, there are major salient features of climate science that bear upon the normative and political questions being considered here. Among these are the probable severity of unmitigated climate change, the likelihood of irreversible effects, and the possibility of catastrophic climate change (defined here, at a minimum, as the substantial disintegration of the Greenland and West Antarctic ice sheets). Each of these empirical claims about the nature of the climate system has normative consequences.

The most comprehensive analysis of the science of climate change is found in the reports of the Intergovernmental Panel on Climate Change (IPCC). Indeed, the four IPCC assessments of the peer-reviewed science of climate change probably represent the most comprehensive examination of any scientific question in human history. As a consequence of the level of scientific effort applied to questions about climate change, a robust understanding of the key dynamics has emerged, supported by multiple mutually-reinforcing lines of evidence. The strength of the scientific consensus is reflected in a remarkable statement from the national science academies of the G8 countries plus Brazil, China, India, Mexico, and South Africa.[4] This statement highlights the strength of the scientific consensus, the seriousness of climate change, and the need for governments to take action.

The climatic consequences of burning all known reserves of oil, gas, and coal are expected to be substantial.[5] In the Summary for Policymakers included in the *Fourth Assessment Report* of the IPCC, projected impacts from the most likely GHG emission scenarios include a "very likely increase in frequency of hot extremes, heat waves and heavy precipitation" and "very likely precipitation increases in high latitudes and likely decreases in most subtropical land regions, continuing observed recent trends". The summary describes likely impacts on storm intensity, snow cover and permafrost, annual river runoff and water availability, and other changes in climatic parameters that will likely have serious consequences for human civilization.[6] Above 2˚C of warming, the IPCC projects substantial impacts on water, including

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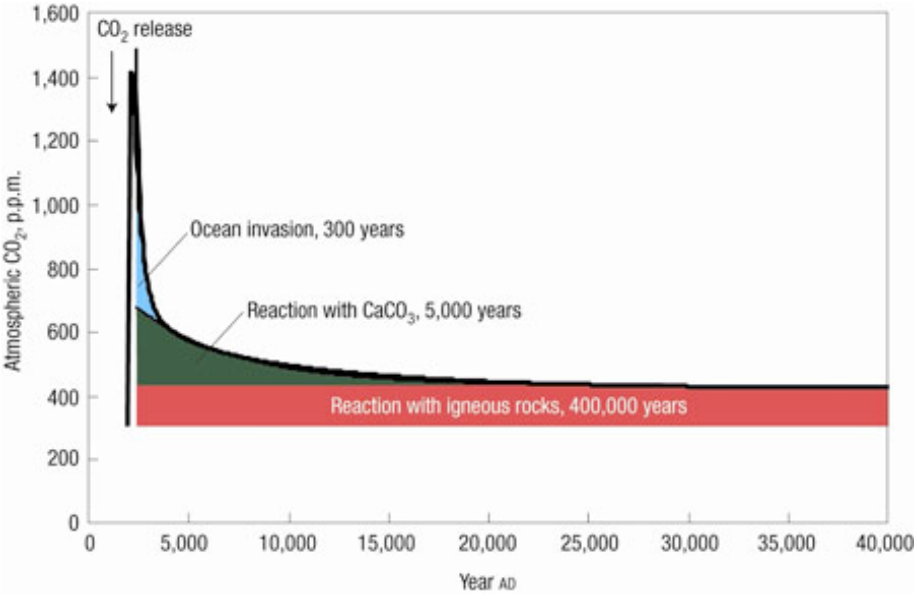
[4] Academia Brasileira de Ciéncias, Brazil, et al, G8+5 Academies' joint statement: Climate change and the transformation of energy technologies for a low carbon future, 2009). http://www.nationalacademies.org/includes/G8+5energy-climate09.pdf

[5] This framing of the problem is employed effectively in: Bill McKibben, "Global Warming's Terrifying New Math," Rolling Stone 2012. http://www.rollingstone.com/politics/news/global-warmings-terrifying-new-math-20120719

[6] Intergovernmental Panel on Climate Change, "IPCC Fourth Assessment Report: Climate Change 2007," (2007). https://www.ipcc.ch/publications_and_data/ar4/syr/en/spms3.html

hundreds of millions of people being exposed to increased water stress, ecosystems (up to 30% of species at increasing risk of extinction), food (including decreases in the productivity of cereal crops), coastlines (millions more people could experience coastal flooding each year), and health (including an increasing burden from malnutrition and disease and morbidity and mortality from heat waves, floods, and droughts). Impacts are expected on every continent, with substantial changes predicted between 2020 and 2050 if GHG emissions are not controlled.

Another scientific fact about climate change with important normative consequences is the duration of the presence of GHGs in the atmosphere. The following graph from *Nature Reports Climate Change* depicts some of the chemical processes through which carbon dioxide is slowly removed from the atmosphere:



Source: (Inman 156-158)

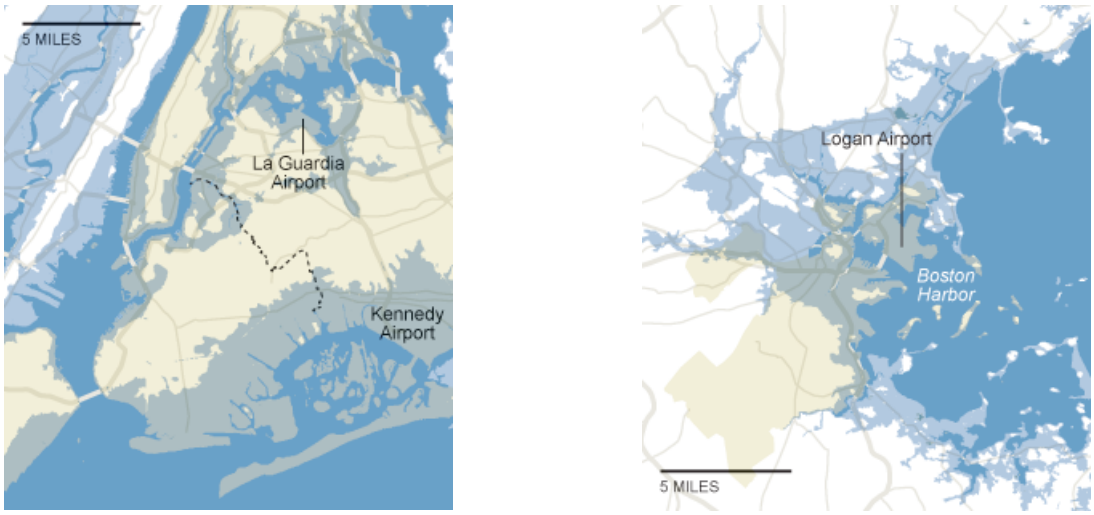
The GHGs emitted today will endure in substantial part for thousands of years, affecting the climate in which many future generations will live.[7] Furthermore, many of the projected effects of climate change are effectively irreversible. For instance, if we warm the planet enough to induce the disintegration of the Greenland and West Antarctic ice sheets, there seems to be no prospect that the resulting sea level rise could be reversed in the foreseeable future. Instead, humanity will need to choose between abandoning large areas of land to the rising oceans or constructing expensive sea walls to hold them back. The losses associated with such changes would be permanent and would include large parts of the world's major cities, as well as substantial portions of states like Bangladesh and the Netherlands.

There is also a danger that positive feedback loops within the climate system could generate abrupt or catastrophic warming. Warming of the Earth causes the arctic ice cap to melt, and the replacement of relatively reflective ice with relatively unreflective seawater itself causes more warming. Other such feedbacks include the release of methane - a powerful greenhouse gas - from melting permafrost. Indeed, given the massive size of the methane reserve in permafrost, it is possible that permafrost melting could bring about abrupt and truly catastrophic climate change on a scale sufficient to threaten human civilization as we know it.[8] Even the possibility of causing such massive and irreparable harm must have some bearing on the moral character of our energy choices. Even relatively limited amounts of warming threaten to push the climate system across thresholds that are significant for human beings. For instance, 1˚C of warming might commit us to the disintegration of the Greenland ice sheet, with seven metres of

[7] Gardiner, p. 197

[8] James E. Hansen, Storms of my grandchildren : the truth about the coming climate catastrophe and our last chance to save humanity, Pbk. ed. ed. (New York: Bloomsbury, 2011).

accompanying sea level rise. 2˚C of warming might add to that disintegration of the West Antarctic ice sheet, with a further seven metres of sea level rise.[9]



Effect of 50% melting of the Greenland and West Antarctic ice sheets on New York City and Boston. Source: ("What could Disappear.")

It is possible that humanity will commit itself irreversibly to such impacts within the next twenty years, though it may take centuries for the ice sheets to actually melt. Producing such catastrophic outcomes does not require any worsening of our current behaviour, only the continuation of what is happening today.

There are also features of climate science that help to explain the world's ineffective action to date; in particular, the time delay between when GHGs are emitted and when their full effects are felt disguises the seriousness of the problem. Like a naive alcohol drinker who consumes ten shots of vodka in rapid succession and then claims not to be overly drunk (and vodka not to be overly intoxicating), politicians today are arguably not paying enough attention to the full extent of the climatic change we are committing ourselves to by continuing to add tens of billions of tonnes of CO2 to the atmosphere every year.

[9] Gardiner, p. 190

Climate ethics

In recent years, a detailed literature on climate change ethics has emerged, with important theoretical contributions made by Henry Shue, Stephen Gardiner, and others. This literature is useful for evaluating the applicability of climate science, and for moving the project of appropriately incorporating climate change concerns into public policy forward.[10]

Moral philosopher Henry Shue highlights the innocence and defencelessness of climate change victims as an important part of the normative argument for taking more meaningful action on climate change now. He argues that "it is highly significant morally whether one is choosing a risk for oneself or imposing it, conditionally or unconditionally, on others" and goes on to say: "That we are imposing risks that others will inherit at birth is extremely important." [11] It is particularly significant that the risks being imposed through climate change are potentially catastrophic and irreversible. The one-way relationship between the current generation and those that will follow also has ethical consequences, insofar as "they are at our mercy, but we are out of their reach." [12]

In analyzing the ethics of climate change, Stephen Gardiner describes a 'perfect moral storm' in which human psychology and our present institutional arrangements cause people to disregard the rights and interests of those living in the future. In particular, Gardiner draws attention to the problem of 'moral corruption':

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[10] For a good short summary of the climate ethics literature, see: Gardiner, Stephen. "Ethics and Global Climate Change" in Climate Ethics : Essential Readings, ed. Stephen Mark Gardiner (New York: Oxford University Press, 2010). p. 3-35

[11] Shue, Henry. "Deadly Delays, Saving Opportunities." in Climate Ethics : Essential Readings, ed. Stephen Mark Gardiner (New York: Oxford University Press, 2010). p. 147

[12] Shue, Henry. "Deadly Delays, Saving Opportunities." in Climate Ethics : Essential Readings, ed. Stephen Mark Gardiner (New York: Oxford University Press, 2010). p. 151

> "In the perfect moral storm, our position is not that of idealized neutral observers, but rather judges in our own case, with no one to properly hold us accountable. This makes it all too easy to slip into weak and self-serving ways of thinking, supported by a convenient apathy or ideological fervor. Moreover, the devices of such corruption are sophisticated, and often function indirectly, by infiltrating the terms of ethical and epistemic argument."[13]

Features of moral corruption include complacency, selective attention, pandering, and delusion. Politicians subject to moral corruption "emphasize considerations that appear to make inaction excusable, or even desirable".[14] Under these conditions, there is an acute danger that weak arguments supporting inaction on climate change will be widely accepted and that 'shadow solutions' will be adopted in place of those that could actually resolve the problem. For instance, we might create ineffective carbon pricing systems that grant valuable emission allowances to firms, but which do not effectively curtail GHG emissions.[15] In Gardiner's perfect moral storm "the asymmetric power of the rich, the current generation, and humanity" is imposed at the expense of "the future of the planet, and the corresponding vulnerability of the poor, future generations, and the rest of nature." [16] The special characteristics of climate change - such as temporal and spatial distribution of impacts - generate and worsen this dynamic.

One example of moral corruption can be found in prominent economic assessments of climate change that employ a high discount rate – most prominently, those of William Nordhaus.[17] The use of such a discount rate may seem defensible if we assume that the recent past is a credible guide to the next few centuries of human experience. If people really will continue to grow ever-richer and more capable of absorbing natural shocks, perhaps we should

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[13] Gardiner, p. xii

[14] Gardiner, Stephen. "A Perfect Moral Storm." in Climate Ethics : Essential Readings p.94

[15] Also, the world for the most part continues to ignore the emissions that are embedded in imports, as well as those arising in response to the warming that has already taken place, such as methane being released from melting permafrost.

[16] Gardiner, p. 439

[17] See, for instance: William Nordhaus, "Critical Assumptions in the Stern Review on Climate Change," Science (New York, N.Y.) 317.5835 (2007): 201-2,.

not be concerned about passing along major climatic threats to future generations. Unfortunately, what we know about the science of climate change seriously undermines the viability of such arguments. If the centuries ahead are likely to be characterized by severe global destabilization, we cannot count on the increased wealth of future generations to offset the harm from today's emissions.[18] Also, the practical consequence of employing a high discount rate is to dismiss as irrelevant the interests of everyone living in the distant future. This clashes with ethical claims like the fundamental right of all people to have their interests considered, and the obligation of each generation to pass along a habitable planet to its descendants.[19] Shrinking away the harms of climate change by discounting also sits at odds with the likelihood of irreversible losses that would accompany substantial warming. We cannot buy back the Great Barrier Reef or the arctic permafrost once they are gone. Nor can we buy back lost species. Even if we reject the view that non-human nature has some inherent value, this sort of destruction closes off possibilities for future generations and may diminish their ability to manage the changes that are to come. By contrast, economic analyses that employ a low discount rate and thus show concern for the welfare of future generations tend to strongly favour aggressive action on climate change, most importantly by limiting fossil fuel use.[20] Unless we implicitly choose to ignore the medium-to-distant future, the case for action on climate change is strong.

Henry Shue also considers what the features of a just response to climate change would be, given the world's existing injustices and inequalities. In assessing how the burden of

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[18] See: Shue, Henry. "Deadly Delays, Saving Opportunities" in Climate Ethics : Essential Readings p. 157

[19] Gardiner, p. 175

[20] N. H. Stern, The economics of climate change : the Stern review (Cambridge: Cambridge University Press, 2007) xxix, 692.
Stern, Nicholas. "The Economics of Climate Change" in Climate Ethics : Essential Readings p. 39-76
See also: World Bank, Turn Down the Heat: Why a 4˚C Warmer World Must be Avoided, 2012).
http://climatechange.worldbank.org/sites/default/files/Turn_Down_the_heat_Why_a_4_degree_centrigrade_warmer_world_must_be_avoided.pdf

addressing climate change should be distributed, Shue draws a distinction between 'subsistence' emissions associated with vital needs like food and shelter and 'luxury' emissions associated with non-necessities like recreational foreign travel. Shue argues: "The central point about equity is that it is not equitable to ask some people to surrender necessities so that other people can retain luxuries." [21] The importance of this triage of sacrifice is not diminished by the urgency of addressing climate change. Shue explains:

> "Even in an emergency one pawns the jewellery before selling the blankets... Whatever justice may positively require, it does not permit that poor nations be told to sell their blankets [compromise their development strategies] in order that rich nations keep their jewellery [continue their unsustainable lifestyles]." [22]

There is, however, a danger that well-intentioned concern about intragenerational justice can serve as a mechanism for advancing moral corruption. For instance, the continued reality of extreme poverty in China cannot be used as a blanket justification for unlimited coal burning in China's relatively affluent coastal cities, or as a justification for lavish lifestyles enjoyed by a wealthy minority of Chinese citizens. More generally, the persistence of extreme poverty in much of the world cannot provide developing countries with a universal exemption from the global obligation to control GHG emissions. A related danger is that states will continue to use one another's inaction as justification for delay, for instance when Canada refuses to adopt binding emission reduction targets until "all major emitters" have done the same.[23]

University academics are not the only people making a contribution to the literature on climate ethics. Indeed, one measure of the growing popular awareness and engagement with normative climate issues is the existence of popular accounts of the subject written for a general

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[21] Shue, Henry. "Subsistence Emissions and Luxury Emissions." in Climate Ethics : Essential Readings p. 212

[22] Shue, Henry. "The Unavoidability of Justice." in The International Politics of the Environment, Actors, Interests, and Institutions, ed. Andrew Hurrell and Benedict Kingsbury (New York: Oxford University Press, 1992).

[23] "Canada Won't Budge on Environment, Peter Kent Insists." The Globe and Mail 2012, . http://www.theglobeandmail.com/news/politics/canada-wont-budge-on-environment-peter-kent-insists/article5872465/

audience. These include books that make detailed proposals for the decarbonization of economies, such as British journalist George Monbiot's *Heat: How to Stop the Planet From Burning*.[24] They also include more limited analyses that concentrate on issues of ethics, uncertainty, and risk. Notable among these is the work of Greg Craven, an American high school science teacher who began by producing a YouTube video that sought to disentangle uncertainty about the seriousness of climate change from the decision of whether or not to mitigate GHG emissions.[25] This video has now been watched more than 5.6 million times. Craven later produced a book on the same subject, intended for a non-specialist audience.[26] Craven's argument is that there are essentially four possible future worlds: two in which climate change proves very serious and two where it does not, and two in which significant action is taken and two where it is not:

	Climate change serious	**Climate change benign**
Action taken	Prudence rewarded	Wasteful mitigation
No action taken	Global catastrophe	Inaction justified

Craven argues that we can choose between the rows in the table above, by either taking action or not doing so. What we cannot do is choose between the columns. If we choose inaction, we commit ourselves to ending up in one of two possible scenarios: one in which climate change proves benign and we avoid wasteful investment in mitigation, and another in which climate change is severe and unmitigated, resulting in planetary catastrophe. By contrast, choosing an

[24] George Monbiot, Heat : how to stop the planet from burning, ed. Matthew Prescott (Toronto: Doubleday Canada, 2006).
[25] Greg Craven, The Most Terrifying Video You'll Ever See YouTube, 2007). https://www.youtube.com/watch?v=zORv8wwiadQ
[26] Greg Craven, What's the worst that could happen? : a rational response to the climate change debate, 1st ed. (New York: Perigee, 2009).

active path of mitigation sets up humanity to either end up in a situation where the money was well-spent or in another where the mitigation spending was wasteful, but climate change still wasn't a catastrophe. Craven argues that the risk of catastrophe that accompanies the choice to be inactive in the face of climate change is unacceptable, and therefore that we must choose to act even if we are not absolutely certain that climate change is as dangerous as most scientists fear.[27]

This echoes a point made by Henry Shue. He equates the decision to persist in the unlimited release of GHGs to playing Russian roulette with somebody else's head:

> "If I play Russian roulette with your head for my amusement as you doze and the hammer of the revolver falls on an empty chamber, I will have done you no physical harm. But I will have seriously wronged you by subjecting you to the unnecessary risk."[28]

By analogy, even in a climate scenario where we gamble with inaction and 'win', we are exposing members of future generations to a risk that may be unacceptable.[29] As such, the fact that we have good scientific reasons to think that sufficiently severe climate change could be catastrophic for humanity, and that creating such climate change is possible given the quantity of fossil fuel available on Earth, is itself sufficient cause to justify strong precautionary action. To behave otherwise is to inflict "damage or the risk of damage on the innocent and defenseless".[30]

One important feature of many ethical analyses of climate change is that they change the structure of the choice being presented from one where each decision to consume fossil fuels is made at the margin to one in which people choose between whole future pathways of development. An individual confronted with the choice to buy a gasoline-powered vehicle,

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[27] This conclusion accords with those of Gardiner and others. For instance, Gardiner claims that: "If our generation (on the wide understanding of the term) causes such an apocalypse through reckless activity, then we will have done a grave wrong". Gardiner, p. 170

[28] Shue, Henry. "Deadly Delays, Saving Opportunities." in Climate Ethics : Essential Readings p. 152

[29] Stephen Gardiner adds that our obligation to employ the precautionary principle may be strongest when it is innocent others who risk having unacceptable outcomes imposed upon them. Gardiner, p. 414

[30] Shue, Henry. "Deadly Delays, Saving Opportunities." in Climate Ethics : Essential Readings p. 153

electric vehicle, or bus pass may think only about their own preferences and economic situation. By contrast, when decision-makers and the public are asked to choose between one future characterized by continued fossil fuel dependence and worsening climatic destabilization and another characterized by an aggressive transition away from fossil fuels and relative climatic stability, it might be hoped that they will find themselves inclined toward the safer and more empathetic choice.

Climate change and democratic legitimacy

'Legitimacy' can be a challenging term to define in a non-circular way. One promising avenue for engaging with the concept is to consider democratic government as a form of delegated authority and responsibility, with individual citizens handing off a certain measure of each to their governments. Gardiner explains that:

> "According to a traditional view in political thought, social and political institutions are legitimate because, and to the extent that, citizens delegate their own responsibilities and powers to them. On this account, if the attempt to delegate effectively has failed, then the responsibility falls back on the citizens again, either to solve the problems themselves, or else, 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." [31]

Delving deeper into the nature of democratic legitimacy, at least two distinct variants can be identified. There is legitimacy as popular perception, which reflects the belief within a polity that political power is being used in an appropriate way, in keeping with the democratic principles of the state and the consent and support of the populace. There is also a more abstracted form of normative legitimacy, which refers to a carefully considered neutral assessment, well-informed with both empirical data and normative analysis. One might imagine this latter form as the

[31] Gardiner, p. 403 (see also p. 432-3)

judgment of impartial observers, located at no particular historical time, who possess knowledge of the full consequences of different climate and energy choices and capable and are able to impartially assess the normative appropriateness of different choices.

The disjuncture between these two conceptions of legitimacy connects closely to Gardiner's concept of moral corruption, and also to the notion of a conflict of interest between the current generation and all future generations regarding the optimal level of CO2 in the atmosphere and corresponding commitment to warming. Our circumstances as a generation that stands to benefit from fossil fuel use - while also dying before the full impact of climate change is felt - may causes us to assign less priority to climate change mitigation than impartial observers would. If this happens, we are arguably suffering from moral corruption and perpetuating an intergenerational conflict of interest. At a minimum, it seems likely that an independent observer would view many of our uses of fossil fuel as relatively wasteful and frivolous and would by sympathetic to the claim that the utility derived from such usage does not justify the severe risks being imposed on future generations as a result.

Institutions to protect future generations

Arguably, the greatest disadvantage borne by members of future generations is their lack of effective representation in legislative and judicial institutions. In Canada, parliamentarians respond to the preferences of existing voters, not of those who will exist decades and centuries in the future. Similarly, the courts have generally considered the material interests of parties present today to be far more important than those of future victims who cannot be present to make their own case. These institutional weaknesses are compounded by the geographical dispersion of climate change impacts. Most of the benefits of oil sands exploitation, to take one example,

accrue in Canada, while most of the harm associated with the extra emissions is imposed on non-Canadians. Canadian institutions are not currently well designed to take this harm into account, and international institutions that have this mandate and the ability to influence Canadian behaviour do not yet exist.[32]

New domestic institutions could potentially be created with the intention of asserting the right of future generations to a stable and reasonably agreeable climate. These could be modeled upon other hands-off mechanisms that governments have established to protect the interests of those in the future against the danger of predation by those focused exclusively on today's welfare. For instance, they could be modeled on central banks with a mandate to maintain price stability regardless of the desire of every government to spur short-term economic growth during its own tenure. Another model could be pension or sovereign wealth funds that are charged with protecting funds for the benefit of those in future decades or even centuries. Alternatively, these new institutions could be modeled upon those that already exist with the intent of protecting the defenceless from exploitation, including the legal mechanisms used for the protection of children.

What all these institutional approaches have in common is a desire to counterbalance the urgent demands of the present with consideration for the future. As with the constitutional guarantees of minority rights that constrain the law-making power of the majority, these sorts of institutional arrangements exist precisely to limit the choices of those alive today, in recognition of how those choices risk being excessively present-focused and characterized by a disregard for

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[32] For a more comprehensive discussion of climate politics in Canada, see: Jeffrey Simpson, Hot air : meeting Canada's climate change challenge, ed. Mark Kenneth Jaccard and Nic Rivers (Toronto: McClelland &Stewart, 2007).
Hard Choices : Climate Change in Canada, ed. Harold G. Coward, Andrew John Weaver and University of Victoria (B.C.). (Waterloo, Ont.: Published for Centre for Studies in Religion and Society by WLU Press, 2004).
Andrew John Weaver, Keeping our cool : Canada in a warming world (Toronto: Viking, 2008).

the welfare of those in the future. George Monbiot comments on this curious aspect of the climate problem:

> "[The campaign against climate change] is a campaign not for abundance but for austerity. It is a campaign not for more freedom but for less. Strangest of all, it is a campaign not just against other people, but against ourselves." [33]

For institutions of this type to emerge, there would need to be a sufficient level of popular or elite will to create them. This may prove especially challenging to generate in multi-party democratic states. If one political party or government promises or implements such institutions, there will always be a temptation for competing parties to promise the abolition or non-implementation of the system. Given the excessive concern of voters about the rate of short-term economic growth, there will always be a temptation to scrap the protections of the future in exchange for a spurt of present-day welfare and an accompanying jump in political support. Still, the fact that pension funds have generally gone unraided in well-managed democratic societies, while independent central banks have for the most part operated without excessive political interference, suggests that such institutions may be able to emerge and remain viable, provided the rationale for their existence becomes generally accepted by societal elites and the population at large. Achieving this requires overcoming the moral corruption described by Gardiner, along with a willingness to reject shadow solutions like waiting around for miraculous zero-carbon energy technologies to emerge.

If governments took the threat from climate change seriously, they could choose to ration CO2 emissions as a strategic commodity - akin to the rationing of rubber or copper use during the second world war. Governments could establish carbon rationing boards and a carbon budget, with restrictions on the total quantity of fossil fuels that could extracted or imported in a

[33] Monbiot, p. 215

year. Rationing could be done in many different ways, including by the per capita distribution of the quota amount with trading permitted after the fact, or by the auctioning of permits to emit. The system could also incorporate treatment of the implicit emissions embedded in imports; for instance, anyone wishing to import an emissions-intensive commodity like steel could be made to pay a carbon price in the form of a carbon tariff paid at the border. These national emission budgets could be coordinated globally in order to produce an emission pathway compatible with any particular limit for warming, such as the 2˚C limit already widely endorsed by governments.

In some ways, however, the aspiration to embody the climatic rights of future generations through institutions puts the cart before the horse. For people to accept the creation of institutions that will limit their ability to use energy as they wish, there must be a pre-existing willingness to see such restriction as acceptable. If elites and the general public continue to reject the idea that emissions of greenhouse gases must be substantially restricted, it is unclear how institutions with that objective could emerge or endure.

While the population as a whole must choose between sacrificing some of the benefits of fossil fuel use and causing potentially catastrophic climate change, there are some entities within society that are more implacably opposed to a transition to zero-carbon forms of energy, particularly fossil fuel companies. A substantial portion of the value of these companies reflects the assumed value of the fossil fuel reserves they hold. In a world where fossil fuels are progressively abandoned in favour of alternative sources of energy as a way of capping the harmfulness of climate change, many of these reserves will prove unsellable. Because of this: "The friends of fossil fuel - the carbon peddlers - have joined the enemies of humanity." [34] These firms can be expected to continue to use their resources to confuse politicians and the public on

[34] Shue, Henry. "Deadly Delays, Saving Opportunities" in Climate Ethics : Essential Readings p. 155

the issue of climate change, as well as to lobby for *status quo* policies that permit and even encourage the unlimited exploitation of fossil fuels. Given this, an institutional response to climate change may need to incorporate more than just the construction of new institutions to protect the rights of future generations - it may require the reformation of existing institutions to diminish the influence of spoilers like fossil fuel companies who are determined to keep emitting carbon at any societal cost.

A changed conception of citizenship

As an alternative or an accompaniment to improved institutional representation for future generations, it may be desirable or effective to try to alter norms of democratic participation. One perspective on democratic politics is that citizens should use their vote and political influence only to advance their own interests, often conceived in purely material terms. This kind of self-interested democratic participation can be considered narcissistic or even psychopathic when the choices being made threaten members of future generations. If citizens can shift their thinking to see themselves as part of a democratic polity with an obligation to pass on a stable and habitable world, they may demonstrate a greater willingness to sacrifice the short-term benefits associated with unlimited fossil fuel use in order to lessen the burden of instability they are passing on to future generations, as well as reduce the risks they are imposing on the non-human parts of nature.[35] By implementing that obligation through reduced GHG pollution and the development of zero-carbon sources of energy, the present generation has the capacity to leave future generations "a legacy of security instead of a legacy of danger".[36]

[35] Some interesting discussion of the theoretical relationship between activist groups and the state - as well as the tactics used by activist organizations - can be found in: Miriam Catherine Smith, A civil society? : collective actors in Canadian political life (Peterborough, Ont.: Broadview Press, 2005).

[36] Shue, Henry. "Deadly Delays, Saving Opportunities." in Climate Ethics : Essential Readings p. 158

This changed conception of citizenship would need to differ significantly from the narcissistic or psychopathic form of democratic participation described above, in which the rights and interests of future generations are treated as effectively irrelevant. The new conception would need to incorporate three critical elements: a realistic empirical understanding of the probable consequences of continued unlimited fossil fuel use, a belief that alternatives exist, and a genuine willingness to constrain such use for the benefit of the world as a whole.[37] These elements may be challenging to realize, but their presence may be essential for any climate change mitigation strategy based on mandatory limits to succeed.

In terms of deciding how much fossil fuel should be burned, we can distinguish a 'big choice' between sticking with and abandoning fossil fuels globally, with the climatic consequences that would follow from each option, and a series of 'small choices' in which individuals, firms, and governments make energy choices without thinking about the climate. Through a changed conception of citizenship and the institutional reforms that could facilitate, it may be possible for humanity to make the big choice and opt for a more ethical path. It may be that the citizens of democratic states that are failing to take effective action on climate change have simply failed to grasp the magnitude and importance of the choice confronting them. As climate change impacts become more obvious, they may provide an additional spur to shift toward a form of democratic participation in which the obligation to pass along a hospitable planet compatible with continued human flourishing is taken more seriously.

[37] One convincing demonstration of the possibility of operating human society entirely using energy from zero-carbon sources can be found in: David MacKay, Sustainable Energy - Without the Hot Air (Cambridge: UIT Cambridge Ltd, 2009). Available free online at: http://www.withouthotair.com/

Conclusions

There are good reasons to believe that climate change challenges the legitimacy of democratic governments, both practically and theoretically. The claim that the climate and energy decisions of these governments adequately represent the interests of all morally considerable organisms is at odds with the reality that governments are behaving with reckless disregard for the rights and interests of members of future generations, as well as the non-human parts of nature.

The appropriate response to this situation is less clear. It seems plausible that institutions could be established to effectively curtail the emission of GHGs and protect the interests and rights of future generations, but that the political will to create such institutions does not exist. The concept of moral corruption and a conflict of interest between generations does a good job of allowing us to explain why this might be so. Overcoming those cognitive limitations may require the development of a new understanding of democratic participation, in which citizens must do more than simply seek to maximize their own short-term economic interests.[38] If such a transition could be achieved, it is plausible that it could be more durable and effective than a system based on the unpopular constraint of individual choices by powerful new institutions. Whether such a transition - or any effective response to climate change - can be achieved before a catastrophic level of warming is locked into the climate system remains to be seen, but will probably be decided within the next few decades. If humanity can collectively comprehend the big choice before it and perceive the possibility of leaving a legacy of security rather than harm, perhaps the willingness and determination to make non-psychopathic energy choices will follow.

[38] See: Gardiner, p. 441

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