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Duties of Corrective Justice and Historical Emissions²

This paper addresses the question of whether agents have incurred duties of corrective justice to bear the costs of climate change in virtue of having produced historical emissions, or emissions produced when it was still reasonable to be ignorant of the causes and harmful consequences of climate change. It argues that it is likely that agents have incurred duties of corrective justice in virtue of having produced some of their historical emissions, given that it is likely that they would have produced these emissions had they known, when they produced them, that the emissions would contribute to harmful climate change.

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1. Introduction

It is highly plausible that at least some agents—individual persons and perhaps entities like states and corporations (if they are indeed independent agents)—have moral duties to bear some of the costs of addressing climate change.³ A number of philosophers have argued that these duties are justified, at least in part, by the principle of corrective justice—roughly, the principle that agents who wrongfully cause or contribute to a harm or a threat of future harm incur duties to bear the costs of rectifying the harm or threat.⁴ According to these philosophers, because climate change has likely already resulted in harm and has the potential to result in future harm, and because many agents have wrongfully contributed to climate change by emitting excessive quantities of greenhouse gases, these agents have incurred duties of corrective justice to address climate change by bearing at least some of the costs of doing so.⁵

Despite the apparent simplicity of the above argument, the application of the principle of corrective justice to the circumstances of climate change faces several difficult questions. One question that has generated considerable debate among theorists concerns whether agents have incurred duties of corrective justice in virtue of having produced so-called “historical emissions,” or emissions produced when it was still reasonable for agents to be ignorant of the causes and harmful consequences of climate change. This is the question that I will address in this paper.

There is some uncertainty about when it was still reasonable for emitters to be ignorant of the causes and harmful consequences of climate change. Following several others, I will assume that historical emissions are emissions produced prior to 1990, the year the Intergovernmental Panel on Climate Change (IPCC) published its First Assessment Report.⁶ I will likewise refer to emissions produced after 1990 as “non-historical emissions.”

³ According to the standard categorization, these costs include mitigation costs (the costs of reducing greenhouse gas emissions), adaptation costs (the costs of protecting people from the adverse impacts of climate change), and compensation costs (the costs of compensating people for the adverse impacts of climate change). See, e.g., Caney, 2012.

⁴ See, e.g., Caney, 2005; Vanderheiden, 2008; Bell, 2010; and Cripps, 2013. Defenders of the corrective justice approach tend to defend different versions of the principle. I avoid taking a stand on which version of the principle is correct, apart from my central concern, which is the relevance of reasonable ignorance to duties of corrective justice. Note also that I am conceiving of corrective justice somewhat narrowly. Some theorists take a wider view of corrective justice and hold that principles of corrective justice include principles that assign duties to bear costs in virtue of having benefitted from wrongful behavior. I take no stance on whether these duties are appropriately called “duties of corrective justice” or whether there are such duties. I am only interested in principles that assign duties to those who have themselves engaged in wrongful behavior.

⁵ The principle of corrective justice, as interpreted and applied to the circumstances of climate change, is typically referred to as “the polluter pays principle.” See, e.g., Caney, 2005.

⁶ Among those who place the date at or around 1990 include: Singer, 2002; Caney, 2005; and Vanderheiden, 2011.

Several philosophers have argued that agents have not incurred duties of corrective justice in virtue of having produced historical emissions.⁷ According to these philosophers, corrective justice does not require that agents bear the costs of rectifying the harmful consequences of their actions when the agents were reasonably (i.e., non-culpably) ignorant that their actions would have these consequences.

In this paper, I argue that these philosophers are wrong. I argue that it is likely that many agents have incurred duties of corrective justice to bear some of the costs of addressing climate change in virtue of having produced at least some of their historical emissions.⁸ The basic argument I advance is relatively simple, though, as we will see, there are complications to work through. Roughly, I argue that: (1) in general, agents who were reasonably ignorant that their actions would have harmful effects do not avoid incurring duties of corrective justice if they would have performed the same (or a relevantly similar) action had they known about these effects, and (2) it is likely that many agents who produced excessive historical emissions would have produced these emissions even had they known, when they produced them, that the emissions would contribute to harmful climate change, as evidenced by their failure to reduce their emissions when they actually became aware of these effects. Although this basic line of argument has been previously suggested in the literature discussing historical emissions, it has not, to my knowledge, been developed in any detail.⁹ In what follows, I develop and defend the argument.

It is important to note that even if I am wrong, and agents have not incurred duties of corrective justice in virtue of having produced historical emissions, this does not mean that these agents lack duties of corrective justice altogether. This is because most agents who produced excessive historical emissions also produced excessive non-historical emissions. If the corrective justice approach to climate justice is generally sound, then these agents have incurred duties of corrective justice in virtue of having produced excessive non-historical emissions.

⁷ Caney, 2005, pp. 761-2; Vanderheiden, 2011, Ch. 6; Risse, 2008; Wündisch, 2017; Schüssler, 2011. Note that in a later article, Caney argues that emitters are liable for their historical emissions, but only to the extent that they have benefitted from these emissions. Caney, 2010, 203-228. For a similar view, see Bell, 2011, 391-411.

⁸ Other philosophers, including Henry Shue (1999), Stephen Gardiner (2011), and Alexa Zelletin (2015) have also argued that agents have incurred duties of corrective justice to bear costs in virtue of having produced historical emissions. My argument is significantly different from each of theirs. Whereas Shue and Gardiner argue for a strict liability (or “no fault”) approach to assigning duties of corrective justice, Zelletin argues that states are liable for their historical emissions in virtue of failing to investigate the effects of their emissions.

⁹ Simon Caney (2010) mentions the argument but quickly rejects it. In a footnote to his discussion, Caney thanks Andrew Williams for pressing this line of argument during Caney’s presentation of the paper (Caney, 2010, p. 209, fn. 14). Jonathan Pickering and Christian Barry (2012, p. 674) also very briefly suggest a similar line of argument.

This is not to say that the debate about historical emissions is inconsequential. Whether agents have incurred duties of corrective justice in virtue of having produced historical emissions is highly relevant to the overall *extent* of an agent's duty of corrective justice, or the overall cost of addressing climate change that the agent is required to bear. It is a complex question precisely how liability for historical emissions would affect the extent of different agents' duties, but it is a safe bet that agents who produced large quantities of historical emissions would have considerably more extensive duties of corrective justice than they otherwise would.¹⁰ This is because it is highly plausible that, other things being equal, the extent of an agent's duty of corrective justice to rectify a harm or threat is proportional to the extent of the agent's wrongful causal contributions to the harm or threat.¹¹

Notice that the question of whether agents have incurred duties of corrective justice in virtue of having produced historical emissions is much more consequential if entities like states and corporations can incur duties of corrective justice to bear costs associated with climate change. This is because the total amount of historical emissions attributable to the activities of these entities far exceeds the total amount of historical emissions attributable to the actions of living individual persons, simply due to the former's lack of a natural lifespan. However, the question of whether entities like states and corporations are agents that can incur duties, and especially those that arise from activities that were performed in the distant past, is controversial.¹² Nevertheless, given the focus on the obligations of states in international climate policy, I will assume that states are among the appropriate bearers of duties of corrective justice. Moreover, I will assume that the emissions produced within a state's borders are causally attributable to the state's policy choices.¹³ Finally, because most historical emissions were produced in rich, developed states (like the United States), my discussion will focus on the policies and duties of these states.

One final note. I am only concerned with whether agents *have incurred* (or are likely to have incurred) duties of corrective justice in virtue of having produced historical emissions. It is a separate question, I take it, whether agents should be *held* liable, or asked (or forced) to fulfill the duties they have incurred. For example, there may be procedural or pragmatic reasons that strongly count against holding agents liable for their historical emissions. I will ignore these reasons and focus on

¹⁰ Virtually all theorists of climate justice appear to accept this view. See, e.g.: Caney, 2005.

¹¹ Yet for a view skeptical of this claim, see: Tadros, 2018.

¹² For a discussion of some of the relevant issues in this debate, see: Stilz, 2011, and Boonin, 2011, Chapters 2 and 3.

¹³ Note that this does not rule out that other agents (individuals, corporations, and even other states) can also be causally and morally responsible (and hence liable) for these emissions as well.

the prior question of whether agents have incurred duties of corrective justice in virtue of having produced historical emissions.

The basic plan for the remainder of the paper is this. In Section II, I will discuss the principle that, from the perspective of corrective justice, reasonable ignorance is fully exculpatory: an agent does not incur a duty of corrective justice to bear the costs of rectifying the harmful consequences of one's action when one was reasonably ignorant that one's action would have those consequences. In Section III, I will present my argument against the principle that reasonable ignorance is fully exculpatory. I will argue that reasonable ignorance is not exculpatory when the agent would have performed the same (or a relevantly similar) action under sufficiently better epistemic circumstances. In Section IV, I argue that, prior to 1990, it is likely that rich, developed states would not have substantially reduced their emissions had they been aware that their emissions would contribute to harmful climate change. The main evidence for this claim is the fact that these states failed to reduce their emissions when they actually became aware that their emissions would have this effect. In Sections V and VI, I will present and respond to two important challenges to the inference from what states have done to what they would have done at an earlier time. I briefly conclude in Section VII.

2. The Putative Basis of the Reasonable Ignorance Excuse

My aim in what follows is to investigate whether agents have incurred duties of corrective justice in virtue of having produced historical emissions. Notice, however, that even if reasonable ignorance is not exculpatory, there may be other reasons for why agents have not incurred duties of corrective justice in virtue of having produced at least some of their historical emissions (e.g., other justifications or excuses that agents may have). Therefore, I will only consider whether agents have incurred duties of corrective justice in virtue of having produced historical emissions in circumstance that are relevantly like the circumstances in which agents have incurred duties of corrective justice in virtue of having produced non-historical emissions.

I will therefore also assume that many agents have incurred duties of corrective justice to bear some of the costs of rectifying harmful climate change in virtue of having produced some non-historical emissions. Specifically, I will assume that an agent has incurred a duty of corrective justice in virtue of having produced emissions when:

- (i) the agent's production of the emissions was all-things-considered, fact-relative morally wrong,¹⁴
- (ii) at the time the agent produced the emissions, the agent believed, or ought to have believed, given the evidence available to the agent, that these emissions were contributing to harmful climate change (i.e., they were produced after 1990), and
- (iii) the agent produced the emissions in the absence of any other conditions that might defeat or diminish to a significant degree the agent's responsible agency.

To simplify my discussion, "non-historical emissions" will henceforth refer to emissions in which an agent's production of those emissions satisfies conditions (i), (ii), and (iii). Likewise, "historical emissions" will henceforth refer to emissions in which an agent's production of those emissions satisfies conditions (i) and (iii), but in which, at the time the agent produced the emissions, the agent was reasonably ignorant that the emissions would contribute to harmful climate change (i.e., they were produced prior to 1990).

Given my assumption that agents have incurred duties of corrective justice by producing non-historical emissions, I will assume, more generally, that an agent, A, incurs a duty of corrective justice to bear some of the costs of rectifying a harm or threat of harm, h, in virtue of performing an action, ϕ , when:

- (a) A's ϕ -ing causes or contributes to h,
- (b) it is all-things-considered, fact-relative morally wrong for A to cause or contribute to h by ϕ -ing,
- (c) at the time of A's ϕ -ing, A believes, or ought to believe given the evidence available to A, that ϕ -ing would cause or contribute to h, and
- (d) A ϕ s in the absence of any other conditions that might defeat or significantly diminish A's responsible agency.

¹⁴ The notion of fact-relative wrongness comes from Derek Parfit (2011). According to Parfit, an action is fact-relative wrong if it would be wrong for a person who knows all the facts to perform the action (2011, pp. 150-1).

When an agent performs an action that satisfies conditions (a), (b), (c), and (d), I will call the agent a ‘culpable causer.’

To investigate whether agents have incurred duties of corrective justice by producing historical emissions, I will therefore consider the question of whether an agent incurs a duty of corrective justice to rectify a harm or threat of harm by performing an action that satisfies (a), (b), and (d) but in which, at the time that the agent performs the action, the agent is reasonably ignorant that the action would cause or contribute to the harm or threat of harm. I will call such an agent an ‘ignorant causer.’

I will assume, then, that the following principle underlies the claim that agents have not incurred duties of corrective justice in virtue of having produced historical emissions:

Reasonable Ignorance is Exculpatory (RIE):

If:

- (a) an agent A’s ϕ -ing causes or contributes to a harm or threat of harm, h,
- (b) it is all-things-considered, fact-relative morally wrong for A to cause or contribute to h by ϕ -ing,
- (c) at the time of A’s ϕ -ing, A is reasonably ignorant that A’s ϕ -ing would cause or contribute to h, and
- (d) A ϕ s in the absence of any other conditions that might defeat or significantly diminish A’s responsible agency,

then:

- (e) A does not incur a duty of corrective justice to bear any of the costs of rectifying h (i.e., preventing or compensating for h) in virtue of ϕ -ing.

In short, (RIE) states that an ignorant causer does not incur a duty of corrective justice to bear any of the costs of rectifying the harm or threat of harm she causes or contributes to causing.

In what follows, I aim to demonstrate not only that (RIE) is false, but that (RIE)

is false in a way that implies that agents have incurred duties of corrective justice in virtue of having produced historical emissions. To give an example of an ignorant causer, and to illustrate (RIE), consider the following case, which is closely adapted from a case created by Thomson (who uses the case for a somewhat different purpose):

Light Switch: Bronn always comes home at 9:00PM, and the first thing he does is to flip the light switch in the hallway. He does so this evening. Bronn's flipping the switch causes a circuit to close. By virtue of an extraordinary series of coincidences, unpredictable in advance by anybody, the circuit's being closed causes a release of electricity (a small lightning flash) in V's house next door. Unluckily, V is in its path and is therefore badly burned.¹⁵

Bronn is an ignorant causer. Bronn's flipping the switch both causes a serious harm to V and is all-things-considered, fact-relative morally wrong. Additionally, at the time Bronn flips the switch, Bronn is reasonably ignorant that his flipping the switch would cause the harm to V. Therefore, (RIE) implies that Bronn does not incur a duty of corrective justice to compensate V. (Note also that I am assuming that had Bronn believed that his flipping the switch would cause the harm to V, then B would have incurred a duty of corrective justice to compensate V.)

What evidence is there for (RIE)? Philosophers who have argued that agents have not incurred duties of corrective justice in virtue of having produced historical emissions have typically argued for a principle like (RIE) by claiming that it would be *unfair* for an agent to bear the costs of rectifying a harm or threat of harm that the agent did not know, and could not have reasonably known, that she would cause or contribute to causing.¹⁶ However, these philosophers have not fully spelled out the argument for precisely why it would be unfair for an ignorant causer to bear these costs.¹⁷ It is important to get clear on this argument, especially because some philosophers who have argued that agents *have* incurred duties of corrective justice in virtue of having produced historical emissions have rejected a principle like (RIE) by claiming that it would be unfair for an ignorant causer *not* to bear the costs of rectifying the harm or threat of harm that she causes or contributes to causing

¹⁵ Thomson, 1990, p. 229.

¹⁶ See, e.g.: Caney, 2005, p. 762; Vanderheiden, 2008, Ch. 6; Wündisch, 2017.

¹⁷ Caney (2005, p.762), for instance, appeals to a distinction between what he calls "the perspective of the duty-bearers" versus "the perspective of the rights-holders," and claims that holding agents liable in virtue of their having produced historical emissions would be to unfairly prioritize the perspective of the rights-holders over the perspective of the duty-bearers. However, Caney does not explain *why* doing so would unfairly prioritize the perspective of the rights-holders over that of the duty-bearers.

(again, without very much argument).¹⁸ Therefore, I will attempt to spell out a case for (RIE) that is based on the purported unfairness of requiring that an ignorant causer bear the costs of rectifying the harm or threat of harm that she causes or contributes to causing. For simplicity, I will focus on cases of a single ignorant causer, i.e., where no other agent is causally responsible for the harm or threat. Additionally, I will focus on cases in which the harm has already occurred, as opposed to one in which the harm is threatened. Nothing that might undermine my argument rests on these choices.

In general, it is common for philosophers to hold that considerations of fairness (or justice) determine whether and to what extent agents incur duties of corrective justice.¹⁹ The basic idea is that corrective justice is ultimately concerned with fairness in the distribution of the costs of wrongful behavior. With respect to wrongful behavior that causes harm to others, corrective justice considers whether and to what extent it would be fair for the agent who wrongfully causes the harm to bear the cost of the harm (by rectifying it), rather than for those who did not cause the harm to bear the cost of the harm. If it would be fair for the agent to bear at least a portion of the cost of the harm she causes, then the agent incurs a duty of corrective justice to bear that cost in service of rectifying the harm.²⁰ If it would not be fair for the agent to bear even a portion of the cost of the harm she causes, then the agent does not incur a duty of corrective justice to bear any of the cost of the harm. Note, finally, that if the cost that an agent incurs a duty of corrective justice to bear is less than the total cost of the harm that the agent causes, then whether it is fair for the *victim* of the harm to bear the remaining cost herself (by, e.g., suffering the uncompensated harm) is determined by considerations other than those of corrective justice (like considerations of, say, distributive justice or beneficence).

Therefore, if it would be fair for an ignorant causer to bear some portion of the cost of the harm she causes, rather than for others to bear the entire cost, then the ignorant causer incurs a duty of corrective justice to bear that portion of the cost, and (RIE) is false. If, on the other hand, it would not be fair for the ignorant causer to bear even a portion of the cost of the harm, then the ignorant causer does not incur a duty of corrective justice to bear any of the cost of rectifying the harm, and (RIE) is true.

Why, then, might it not be fair for the ignorant causer to bear even a portion of the cost of the harm she causes? To answer this question, it is important first to note,

¹⁸ See Shue, 1999, p. 535-6 and Gardiner, 2011, Ch. 11.

¹⁹ See, e.g., Coleman, 1995, and Tadros, 2011.

²⁰ Note that the question that is relevant to corrective justice is whether and to what extent it is fair for the causer of the harm *qua causer of the harm* to bear the cost of the harm. It may be fair for the causer of the harm to bear a portion of the cost of the harm on the basis of, say, her ability to bear it. But if the causer of the harm incurs a duty to bear the cost for this reason, the duty is not one of corrective justice.

as McMahan and others have pointed out, that there is a general moral presumption against shifting harm, including the cost of a harm.²¹ That is, morality does not require, and often prohibits, that individuals suffer the harms, or bear the cost of the harms, that befall others unless there is a morally significant reason for them to do so. For example, if a boulder naturally dislodges from a cliff and lands on my car, then under typical circumstances (e.g., in the absence of a preexisting liability agreement), you do not have a duty to compensate me for the damage the boulder causes, and I am not permitted to force you to compensate me. The bad luck is mine, and other things being equal, it would not be fair for you to bear the cost of my bad luck.

That there is a presumption against shifting harm does not mean, of course, that the presumption cannot be overcome. Perhaps, for example, considerations of beneficence can justify shifting some of the costs of particularly serious harms to those who can bear the costs without significant reductions to their well-being.²² Moreover, with respect to corrective justice, nearly everyone believes that the presumption against shifting harm is overcome in cases in which the harm is caused by a *culpable* causer. Suppose, for example, that for no good reason you intentionally dislodge a boulder from a cliff with the goal of damaging my car, and you succeed in doing so. Your culpability for causing the harm is sufficient to justify shifting the entire cost of the harm to you. It is fair for you, rather than me (or any other non-responsible party), to bear the entire cost of the harm, and so you incur a duty of corrective justice to compensate me fully for the harm you wrongfully caused.

Given this presumption against shifting harm, the question, then, is whether the presumption is overcome in cases involving an ignorant causer. In other words, is there sufficient justification to shift even a portion of the cost of the harm caused by an ignorant causer from the victim of the harm to the ignorant causer—namely, a reason that makes it fair for the ignorant causer to bear at least a portion of the cost of the harm? According to defenders of (RIE), there is not. Therefore, the cost of the harm ultimately must be borne either by the victim or by third parties (perhaps according to some other distributive principle).

How might defenders of (RIE) attempt to justify the claim that there is not sufficient justification for shifting a portion of the cost of the harm to the ignorant causer? First, consider why, in the boulder-pushing case, it is fair for you (the culpable causer), rather than for me (the victim) or third parties, to bear the costs of rectifying the harm you caused. That is, why does a person's culpability for causing a harm make it fair for the culpable causer to bear the cost of the harm?

A plausible explanation appears to be lie, in large part at least, in the difference

²¹ McMahan, 1994.

²² See, e.g., Singer, 1972.

in the quality of the *opportunity* that each party had to avoid bearing the cost of the harm.²³ You (the culpable causer) had an excellent opportunity to avoid bearing the cost of the harm—that is, to avoid bearing the cost of compensating me. You could have avoided bearing this cost simply by choosing to refrain from causing the harm, which given your culpability, you were morally obligated to do and were fully capable of doing. Thus, you have, at best, only a very weak objection to bearing the full cost of the harm. On the other hand, through no fault of my own, my property is destroyed, and I had no reasonable way to avoid bearing this cost. Similarly, third parties had no reasonable way to avoid bearing the cost of the harm (if the cost were ultimately allocated to them). Hence I, as well as third parties, have a very powerful objection to bearing the cost of the harm. It would therefore be fair for you, rather than for me or any third parties, to bear any of the cost of the harm, and so you incur a duty of corrective justice to compensate me.

Notice, however, that a similar explanation cannot be given for why it would be fair for the ignorant causer, rather than for the victim or third parties, to bear the cost of a harm caused by the ignorant causer. The ignorant causer, like the victim and third parties, has a strong objection to bearing the cost of the harm in virtue of lacking a reasonable opportunity to avoid bearing it. For instance, in *Light Switch*, although V is in no way liable to bear the cost of the harm and lacked a reasonable opportunity to avoid suffering the harm, Bronn also lacked a reasonable opportunity to avoid bearing the cost of the harm. Because Bronn did not know that his flipping the switch would cause the harm, Bronn did not choose to cause the harm, either intentionally or as a side-effect of an intended outcome. So unlike the culpable causer, Bronn did not have a reasonable opportunity to avoid causing the harm. Therefore, unlike a culpable causer, Bronn has a powerful objection to bearing the cost of the harm.

The defender of (RIE) can claim that because the victim of the harm and the ignorant causer each has a strong objection to bearing the cost of the harm (in virtue of lacking a reasonable opportunity to avoid bearing this cost), there does not appear to be any moral basis on which to justify shifting the cost of the harm from the victim of the harm to the ignorant causer. Therefore, the presumption against shifting the cost of the harm to the ignorant causer is not overcome. According to the defender of (RIE), it would be fair for either the victim of the harm or third parties (on the basis of some other principle), rather than the ignorant causer, to bear the cost of the harm. Therefore, the ignorant causer does not incur a duty of corrective justice to bear any of the cost of the harm.

This argument for (RIE) is plausible. Nevertheless, in the next section, I will

²³ See, e.g., Scanlon, 1998, Ch. 6; Tadros, 2011, McMahan, 2002, p. 401.

argue that it fails to establish that it is *never* fair for an ignorant causer to bear the cost of the harm he causes. I will argue that there are circumstances in which it would be fair for an ignorant causer to bear the cost of the harm she causes, even though the ignorant causer lacked a reasonable opportunity to avoid bearing the cost of the harm (and despite the presumption against shifting the cost of the harm from the victim to the ignorant causer). Hence, these are circumstances in which an ignorant causer incurs a duty of corrective justice to bear the cost of the harm she causes. These circumstances, therefore, provide a counterexample to (RIE). Later, I will argue that these circumstances are also those in which many agents produced historical emissions.

3. An Exception to the Reasonable Ignorance Defense

In this section, I will argue that (RIE) is false. The claim that I will argue for, and that implies that (RIE) is false, is that an ignorant causer incurs a duty of corrective justice to bear the costs of rectifying a harm she causes if she *would have* performed the same action had she known, at the time she performed the action, that her action would cause the harm. More formally, I will argue for the following principle:

Exception to Reasonable Ignorance is Exculpatory (ERIE): An agent, A, incurs a duty of corrective justice to bear some of the costs of rectifying a harm or threat of harm, h, in virtue of A's performing an action, ϕ , when:

- (a) A's ϕ -ing causes or contributes to h,
- (b) it is all-things-considered, fact-relative morally wrong for A to cause or contribute to h by ϕ -ing,
- (c) at the time of A's ϕ -ing, A is reasonably ignorant that A's ϕ -ing would cause or contribute to h,
- (d) A ϕ s in the absence of any other conditions that might defeat or significantly diminish A's responsible agency, and

- (e) had A known, at the time of A's ϕ -ing, that A's ϕ -ing would cause or contribute to h, A would have ϕ -ed.²⁴

Recall that (RIE) holds that A does *not* incur a duty of corrective justice to bear any of the costs of rectifying a harm or threat of harm when conditions (a), (b), (c), and (d) are satisfied. So if (ERIE) is true, then (RIE) is false.

To illustrate (ERIE), consider again *Light Switch*. Recall that in *Light Switch*, (RIE) implies that, as an ignorant causer, Bronn does not incur a duty of corrective justice to compensate V. However, suppose that the following counterfactual is true of Bronn: had Bronn known, at the time that he flips the switch, that flipping the switch would cause the injury to V, Bronn would have flipped the switch anyway. We can add a few details to the case to provide further context for the counterfactual. Suppose that Bronn was motivated to flip the switch to find his way to the computer room so that he could execute a small trade (which he knows would prevent a \$50 stock loss). Suppose, moreover, that at the time that he flips the switch, Bronn is completely indifferent to V's welfare, such that Bronn would have chosen to avoid any small cost to himself rather than refraining from causing even a serious harm to V. Therefore, had Bronn known that flipping the switch would cause harm to V, Bronn would have flipped the switch to avoid the small cost to himself. Call this variation of the case *Indifferent Switch*.

Here is why (ERIE) is true. If an ignorant causer would have performed the harm-causing action even had she known that her action would result in harm, then the ignorant causer acts *while* ignorant but does not act *from* ignorance.²⁵ That is, although the ignorant causer is, at the time that she performs the action, ignorant that her action would cause the harm, the ignorance does not play a role in explaining why the agent performs the action that she does. For example, in *Indifferent Switch*, Bronn's ignorance does not explain why Bronn flips the switch, given that he would have, had he not been ignorant, performed the same action and for the same reasons that he did (namely, to avoid the \$50 stock loss).

According to defenders of (RIE), an ignorant causer's ignorance is supposed to explain why she does not incur a duty of corrective justice even though she performs an all-things-considered, fact-relative wrongful action that harms someone. After

²⁴ I believe that there is a defensible version (ERIE) in which condition (e) instead states that: had A known *or ought to have known*, at the time of A's ϕ -ing, that A's ϕ -ing would cause or contribute to h, A would have ϕ -ed. Investigating this possibility, however, will take me too far afield, and is unnecessary for establishing my main thesis.

²⁵ This distinction dates back to Aristotle (1999, Bk. 3, Ch. 1, 5). For other (brief) discussions of this distinction, see, e.g., Zimmerman, 1997, p. 424, and Peels, 2014, p. 479.

all, a *culpable* causer, who is exactly like an ignorant causer except for the latter's ignorance, *does* incur a duty of corrective justice. But if an ignorant causer's ignorance does not explain why she performs the harm-causing action, then it is difficult to see how her ignorance can explain why she should be *exempt* from bearing the cost of the harm that results from her action (a cost that, had she not been reasonably ignorant, she would have incurred a duty to bear).

To consider this last claim further, recall why the defender of (RIE) holds that an ignorant causer's ignorance explains why she does not incur a duty to rectify the harm. According to the defender of (RIE), the ignorant causer could object to bearing the cost of the harm she causes by claiming that she lacked a reasonable opportunity to avoid bearing this cost in virtue of the fact that she did not choose to cause the harm, either intentionally or as a foreseen side-effect of an intended outcome. And while it is true that the victim could similarly object that she lacked a reasonable opportunity to avoid bearing the cost of the harm, because of the presumption against shifting the cost of the harm to the ignorant causer, it would be unfair for the ignorant causer to bear the cost of the harm. Therefore, the ignorant causer does not incur a duty of corrective justice to bear the cost of the harm.

Yet consider the ignorant causer's objection that she lacked a reasonable opportunity to avoid bearing the cost of the harm. The basis of the objection seems to be that if she were required to bear the cost of the harm, she would be the victim of bad luck. Given that she did not choose to cause the harm, either intentionally or as a foreseen side-effect, it is essentially a matter of bad luck that there is an unavoidable cost that someone must bear—no different, perhaps, than a harm caused by purely natural factors. And although it is unfortunate that someone must bear the cost of this bad luck, the cost is ultimately not hers to bear, given the presumption against shifting harm.

However, if the ignorant causer would have performed the same action even had she known that her action would cause the harm, then it is false that it is simply a matter of bad luck that there is an unavoidable cost that someone must bear. Thus, it is false that if the ignorant causer were required to bear the cost of the harm, she would be a victim of bad luck. Rather, if she were *not* required to bear the cost of the harm, she would be the beneficiary of very good luck at the expense of the victim's bad luck. For if by chance the ignorant causer had learned that her action would cause harm, then she would have performed the same action and would have been a culpable causer. And as a culpable causer, she would have incurred a duty to bear the cost of the harm, rather than the victim bearing this cost himself. Therefore, if we assume that the fair distribution of the cost of a harm should be sensitive to considerations of luck, then it is fair for the ignorant causer, rather than the victim, to bear the cost of the harm.

Even if we accept my argument for (ERIE), notice that the principle is quite narrow—it states that an ignorant causer incurs a duty to bear the cost of the harm she causes if she would have performed *the same action* had she known that her action would cause the harm. Can we say more than this? Suppose that, had the ignorant causer known that her action would cause harm, she would have performed an action that was morally *worse* (e.g., one that caused more harm overall) than the all-things-considered, fact-relative morally wrongful action she actually performs. For example, suppose that in *Light Switch*, had Bronn known that his flipping the switch would cause the injury to V, Bronn would not have flipped it. However, suppose that the reason that Bronn would not have flipped it is that Bronn intended to inflict a much greater injury on V than the one he actually inflicts by flipping the switch, and Bronn would not have been satisfied by the injury to V produced by flipping the switch. So had Bronn known that flipping the switch would have caused the injury to V, Bronn would not have flipped it, but would have instead opted to inflict an even greater injury on V.

It seems that if Bronn has a duty to compensate V in *Indifferent Switch*, then Bronn has a duty to compensate V in this variation as well. Although Bronn's ignorance explains why he flips the switch, his ignorance explains why he did not perform a morally worse action (rather than a morally permissible action). So Bronn has only a weak objection to bearing the cost of the harm he actually causes, given that had he known that his action would cause harm, he would have incurred a duty to bear an even greater cost (that is, the cost of rectifying the harm resulting from the morally worse action).

Now suppose that had an ignorant causer known that her action would cause harm, she would have performed an action that was morally *better* than the all-things-considered, fact-relative wrongful action she actually performs, yet one that was nevertheless all-things-considered morally wrong (e.g., one that would have caused harm, but just *less* harm than the action she actually performs). So suppose that had Bronn known that flipping the light switch would cause the injury to V, Bronn would not have flipped it, but would have instead inflicted a smaller harm on V. Suppose, for example, that prior to flipping the switch, Bronn intended to dump large amounts of trash into V's yard, and had Bronn not (unwittingly) caused the injury to V by flipping the switch, Bronn would have carried through on his initial trash-dumping plan.

In this case, it seems fair for Bronn to bear the cost of the (actual) harm he causes. His objection to bearing the cost of the harm is still relatively weak, given that he would have performed an all-things-considered wrongful action had he known that his action would cause harm. It is plausible, however, that the maximum cost that Bronn would be required to bear to rectify the harm is lower than it is in those

variations in which he would have performed the same (or a morally worse) action had he known that his action would cause harm.

Given my discussion, we can modify (ERIE) as follows:

*Exception to Reasonable Ignorance is Exculpatory** (ERIE*): An agent, A, incurs a duty of corrective justice to bear some of the costs of rectifying a harm or threat of harm, h, in virtue of A's performing an action, ϕ , when:

- (a) A's ϕ -ing causes or contributes to h,
- (b) it is all-things-considered, fact-relative morally wrong for A to cause or contribute to h by ϕ -ing,
- (c) at the time of A's ϕ -ing, A is reasonably ignorant that A's ϕ -ing would cause or contribute to h,
- (d) A ϕ s in the absence of any other conditions that might defeat or significantly diminish A's responsible agency, and
- (e) had A known, at the time of A's ϕ -ing, that A's ϕ -ing would cause or contribute to h, A would have performed an action that was all-things-considered morally wrong.

4. Applying (ERIE*)

The next step is to apply (ERIE*) to agents' production of historical emissions. Recall that I am assuming that agents' production of historical emissions satisfies conditions (a)-(d) of (ERIE*). I am also assuming that historical emissions only include emissions produced prior to 1990. Finally, I am assuming that states are agents that can incur duties of corrective justice to bear costs associated with climate change. The relevant question, then, is what states—and particularly rich, developed states—would have done, prior to 1990, had they known that their emissions would contribute to harmful climate change.

One important piece of evidence for what these states would have done, prior to 1990, had they known that their emissions would contribute to harmful climate change, is what states *actually* did, after 1990, when they knew that their emissions would contribute to harmful climate change. I have been assuming that after 1990, many states acted all-things-considered morally impermissibly by producing

excessive emissions. That is, I have been assuming that once states (or their leaders) became aware that their emissions would contribute to harmful climate change, these states produced more emissions than they were morally permitted to produce.

I do not think that this assumption is controversial, particularly for rich, developed states, which could have reduced their emissions substantially without sacrificing their citizens' high living standards. Consider that after 1990, not only did most states fail to reduce their emissions substantially, most states *increased* their emissions.²⁶ Overall, between 1990 and 2012, global annual emissions increased by an average of about two percent each year.²⁷ In the United States, annual emissions increased by an average of a quarter of a percent each year during that period.²⁸ And although some European countries did decrease their annual emissions between 1990 and 2012, these reductions were relatively small and were attributable, at least in part, to the outsourcing of manufactured goods consumed in these countries to developing countries.²⁹

The fact that after 1990, many states, and particularly rich, developed states, did not reduce their emissions to morally permissible levels (or much at all) is good evidence that *prior* to 1990, had these states known that their emissions would contribute to harmful climate change, they would not have kept their emissions within morally permissible levels. In the absence of countervailing evidence, we are, I believe, entitled to conclude that it is likely that that prior to 1990, had these states known that their emissions would contribute to harmful climate change, they would not have kept their emissions within morally permissible levels. Therefore, given (ERIE*), we are entitled to conclude that it is likely that many states have incurred duties of corrective justice in virtue of having produced historical emissions.

What countervailing evidence, if any, do we have? Over the next two sections, I will consider and respond to two important challenges to the claim that states' failures to reduce their emissions to morally permissible levels after 1990 means that it is likely that prior to 1990, states would not have kept their emissions within morally permissible levels, had they known that their emissions would contribute to harmful climate change.

5. Challenge I: Path-Dependence

The first challenge considers the effect of *path-dependence* on states' lack of post-1990 action to reduce their emissions to morally permissible levels. It is highly

²⁶ WRI, 2014.

²⁷ WRI, 2014.

²⁸ WRI, 2014.

²⁹ WRI, 2014.

plausible that part of the explanation for why states are now, and have been since 1990, resistant to enact aggressive policies to reduce their emissions to morally permissible levels is that their economies are highly dependent on fossil fuels, making the costs of switching to low carbon energy sources very expensive. Yet when states first began to industrialize, their economies were not yet significantly dependent on fossil fuels. Perhaps it would have been considerably less costly, at that time, for states to enact policies that would have enabled them to develop economically, over the long term, using less carbon-intensive sources of energy. Therefore, perhaps had states known about the climate-altering potential of unabated fossil fuel use, they would have enacted these policies, and thus would have kept their emissions within morally permissible levels.

Let's suppose that, due to the effect of path-dependence, it is true that had states been given very early warning of the climate-altering dangers of their emissions, they would have enacted policies that would have kept their emissions within morally permissible levels.³⁰ Does this mean, then, that states' production of historical emissions does not satisfy condition (e) of (ERIE*)?

Notice that even if it is true that had states received very early warning of the climate-altering dangers of unabated fossil-fuel use, they would have enacted policies that would have kept their emissions within morally permissible levels, it might also be true—and, in fact, it is plausible—that had states come to learn about the causes and consequences of climate change at some later date, they would *not* have enacted policies that would have kept their emissions within morally permissible levels. With respect to the path-dependence of fossil fuel use, perhaps as states' economies became more dependent on fossil fuels, it became less likely that states would have changed course had they learned that their emissions would contribute to harmful climate change. For instance, suppose that the United States had learned, during the 1950's, that its emissions would contribute to harmful climate change. It seems likely that by this time, the United States' economy was dependent on fossil fuels to such an extent that the costs of decarbonization were

³⁰ I actually think that this claim is implausible. As Gardiner (2011) and others have persuasively argued, the lack of meaningful action on climate change by states since 1990 is explained by more than just the high current short-term economic costs of decarbonization, though this is obviously an important factor. States' lack of meaningful action on climate change is also explained by *who* will be primarily harmed by climate change, namely the global poor and future generations. Since past generations of policy-makers were probably equally (or perhaps even less) likely to consider the interests of the global poor and future generations than contemporary policy-makers are and have been, early warning of the climate-altering potential of greenhouse gas emissions would probably not have resulted in policies that ensured that emissions remained within morally permissible levels, even if the costs of enacting such policies were comparatively lower than they are today. Nevertheless, the worry about path-dependence is worth taking seriously if only because it blocks any easy inference from what states have done since 1990 to what states would have done prior to 1990 had they known that they would contribute to harmful climate change.

very high. If so, it is probably true that, had the United States learned, in the 1950's, that its emissions would contribute to harmful climate change, the United States would *not* have kept its emissions within morally permissible levels.

The issue that we must address, I believe, concerns how we should interpret the counterfactual that prior to 1990, had states known that their emissions would contribute to harmful climate change, states would not have reduced their emissions to morally permissible levels. This is because it appears that what states would have done depends on *when* they would have learned about the dangers of climate change. For the purposes of applying (ERIE*), should we consider what states would have done had they had very early warning of the causes and risks of climate change (in which case, perhaps states would have kept their emissions within morally permissible levels) or should we also consider what states would have done had they learned, at some later time or times, that their emissions would contribute to harmful climate change (in which case, perhaps states would not have kept their emissions within morally permissible levels)?

Let's consider the question in a simplified case. Consider:

Soup: Kay discovers, through trial and error, a recipe for a delicious soup. The recipe requires rare ingredients, each of which must be added to the pot in a specific order. Completely unbeknownst to Kay, the specific combination of the ingredients causes the fumes of the soup to become extremely toxic during the cooking process (adding the final ingredient always detoxifies the soup, making it safe to eat). Fortunately for Kay, when cooking the soup, she always has her window open, which allows the fumes from the soup to escape her apartment without ever affecting her. Unfortunately, however, these fumes are blown into her next-door neighbor V's apartment. Kay chooses to make this soup several times, first at t_1 , and then at later times, t_2 , t_3 , etc. After making soup at t_9 , the cumulative effect of the fumes causes V to become very ill, which costs thousands of dollars to treat. At some point— t_{10} —Kay discovers that she is making V very ill. However, Kay continues to make the soup after this discovery. Kay's subsequent soup-making causes her neighbor to become extremely and permanently ill. The cost of treating her neighbor's illness is several thousand dollars more than the cost had been at t_{10} .

I assume that after t_{10} , Kay is a culpable causer, and so Kay has a duty to bear costs in virtue of her post- t_{10} choices to make the soup.

Yet Kay is an ignorant causer with respect to each of her choices to make soup prior to t_{10} . Moreover, suppose that the following counterfactual (C1) is true:

C1: had Kay learned, prior to her first choice to make soup (at t_1), that making the soup would cause harm or risk causing harm to her neighbor, she would not have made the soup at any subsequent time.

Suppose, for instance, that prior to tasting the soup, Kay did not know how delicious the soup was. Having not known how delicious the soup was, she would have decided to put the interests of her neighbor over her desire to make the soup, and so she would not have made it.

Now suppose that when Kay actually makes the soup for the first time (at t_1), Kay discovers that the soup is far more delicious than she could have ever imagined. Suppose, moreover, that the following counterfactual is true:

C2: had Kay learned, after t_1 but prior to t_2 , that making the soup would cause or risk causing harm to V, Kay would have made the soup at t_2 and at all subsequent times that she actually made it.

C1 and C2 are consistent. We can assume, moreover, that Kay does not incur a duty of corrective justice to bear costs in virtue of her choice at t_1 . Yet what should we say about whether Kay incurs a duty of corrective justice to bear costs in virtue of her subsequent choices to make soup, like her choice at t_2 ? According to C1, if Kay had known, prior to t_1 , that making soup would cause harm, she would not have made soup at t_2 . However, according to C2, had Kay learned that making soup would cause harm just after t_1 , she would have made soup at t_2 . Given (ERIE*), should Kay incur a duty to bear costs in virtue of her choice at t_2 ?

Here is an argument for why Kay does not incur a duty of corrective justice in virtue of her choice at t_2 : Kay only causes her neighbor harm *at all* because of her ignorance prior to when she first made soup. Therefore, her ignorance explains all her subsequent choices to contribute to harm, since Kay would not have made these choices had she not been ignorant prior to t_1 . Since this ignorance was reasonable, Kay should not incur a duty of corrective justice to bear costs in virtue of her choice at t_2 .

This argument, however, is unsuccessful. First, notice that according to C1, had Kay learned, prior to t_1 , that her soup-making would cause harm, Kay would not have chosen to make soup even after t_{10} , the time at which she *actually* discovered that her soup-making is causing harm. But clearly Kay does incur a duty to bear costs in virtue of her post- t_{10} choices, even if C1 is true. Therefore, the fact that Kay would not have chosen to make soup at t_2 had she known, prior to t_1 , that her soup-making would cause harm does not necessarily show that she does not incur a duty in virtue of her choice at t_2 .

To investigate further, we can distinguish between two kinds of effect that an agent's ignorance may have on the agent's choice. First, an agent's ignorance may affect the agent's choice by affecting the costs that the agent must bear to satisfy her preferences. Call this an *indirect effect*. C1 describes the indirect effect that Kay's ignorance, prior to t_1 , has on Kay's choice to make soup at t_2 (as well as on all her subsequent choices, including those after t_{10}). We can infer, from C1, that Kay has a preference, at all times, not to cause her neighbor harm. Moreover, Kay's ignorance of the harmful consequences of her soup-making, prior to t_1 , has the effect of raising the costs to her of satisfying this preference at t_2 (and at every subsequent time) in virtue of the fact that she forms a strong preference to make the soup only because she was ignorant of the harmful consequences of her soup-making. Thus, at t_2 (and every subsequent time), she has a stronger preference to make the soup than she has a preference to avoid causing her neighbor harm. Had Kay *not* been ignorant, prior to t_1 , that making the soup would cause harm to her neighbor, it would have been relatively costless for Kay to satisfy her preference to refrain from causing her neighbor harm at t_2 (or any subsequent time), which she would have chosen to do.

An agent's reasonable ignorance is not exculpatory in virtue of its having an indirect effect on the agent's choice to perform a harm-causing action. For example, Kay's ignorance, prior to t_1 , has an indirect effect on her choices to make the soup after t_{10} . However, her ignorance, prior to t_1 , obviously does not defeat her duty to bear costs in virtue of her post- t_{10} choices. So even though Kay's ignorance, prior to t_1 , has an indirect effect on her choice at t_2 , her ignorance, prior to t_1 , does not defeat her duty to bear costs in virtue of her choice at t_2 , either.

An agent's reasonable ignorance is exculpatory only when it has what we can call a *direct effect* on the agent's choice. An agent's ignorance has a direct effect on the agent's choice when the ignorance affects whether the agent chooses the outcome that reflects her preferences at that time. C2 describes the *lack* of a direct effect that Kay's ignorance, at t_2 , has on Kay's choice at t_2 . To see this, suppose that C2 is false. Suppose that had Kay learned, after t_1 but prior to t_2 , that making the soup would cause harm to V, Kay would not have made the soup at t_2 . We can infer that at t_2 , Kay has a stronger preference not to cause harm to her neighbor than she has a preference to make the soup. But K's ignorance, at t_2 , prevents Kay from choosing the option that reflects these preferences, which is why she makes the soup at t_2 .

Now suppose that C2 is true. We can infer that, at t_2 , Kay has a stronger preference to make the soup than she has a preference to refrain from causing her neighbor harm. Because Kay makes soup at t_2 , Kay's ignorance, at t_2 , does *not* prevent Kay from choosing the option that reflects her preference for making soup over her preference not to cause harm. Therefore, C2 indicates that Kay's ignorance does not have a direct effect on her choice to make soup at t_2 . So Kay's ignorance is

not exculpatory for her choice to make soup at t_2 , and thus Kay incurs a duty of corrective justice to bear costs in virtue of her choice at t_2 .

What this means, then, for states' historical emissions, is that the relevant counterfactuals for applying (ERIE*) to states' historical emissions should describe whether a state's ignorance about the harmful effects of its emissions had a direct effect on the state's policies concerning its production of these emissions. So the relevant counterfactuals are those that describe whether the state's ignorance prevented the state from enacting policies that reflected the state's preferences, rather than describing the effect that the ignorance had on the costs of satisfying its preferences.

The claim about path-dependence—that if states had very early warning of the causes and consequences of climate change, they would have enacted policies to keep their emissions within morally permissible levels—describes the direct effect of states' early ignorance of climate change on their *early* energy policies. If the claim about path dependence is true, we can infer that states have a preference to avoid causing large amounts of global environmental harm. We can also infer that when the costs of satisfying this preference are relatively low, as they were during the early periods of industrialization (we are assuming), the preference would have resulted in policies aimed at avoiding causing large amounts of global environmental harm. Thus, ignorance prevented these states from enacting these policies during the early periods of industrialization. So, if the claim about path dependence is true, then states have not incurred duties of corrective justice in virtue of having produced historical emissions very early on during industrialization.

However, the claim about path dependence describes only the indirect effect that states' early ignorance of the harmful effects of unabated fossil fuel use had on their later energy policies. For example, the United States' early ignorance of the harmful effects of unabated fossil fuel use, by the 1950's, had the effect of raising the costs that the United States must bear to satisfy its preference to avoid causing large amounts of global environmental harm. However, this early ignorance did not prevent the United States in the 1950's from choosing to satisfy its stronger preference to avoid these costs (burdening its citizens with the costs of decarbonization) over its preference to avoid causing large amounts of global environmental harm. Therefore, the claim about path-dependence, even if it is true, does not imply that states have not incurred duties of corrective justice in virtue of having produced historical emissions after industrialization was well under way.

6. Challenge II: Slowness to Change Behavior

Let's turn now to the second challenge to the claim that states' failures to reduce their emissions to morally permissible levels after 1990 means that it is likely that, prior to 1990, states would not have kept their emissions within morally permissible levels, had they known that their emissions would contribute to harmful climate change. Consider that, since 1990, although states have not taken anywhere near sufficient action to address climate change, they have also not done absolutely nothing to address it. Most states have publicly acknowledged that climate change is a problem and that climate change is caused by human activities. Additionally, most states have also signaled their willingness to address climate change by signing international agreements in which they promise to reduce their emissions (including, perhaps most notably, the 2015 Paris Agreement, signed by 195 countries). Moreover, many states have enacted domestic policies designed to curb emissions (e.g., cap and trade in the European Union and the regulation of greenhouse gas emissions under the Clean Air Act in the United States).³¹

Perhaps given the long-term trajectory of states' actions to address climate change, in another twenty or fifty or seventy years, collectively, states will have successfully enacted policies that will have significantly reduced their emissions to levels that will not cause significantly more harmful climate change than what we will be committed to by that time.

But if we take what states have done when they learned that they were contributing to harmful climate change as evidence for what states would have done, prior to 1990, had they known that their emissions would contribute to harmful climate change, then perhaps if states had very early warning of the climate-altering potential of unabated fossil fuel use—in the early stages of industrialization, say—then states would have, within, say, fifty or eighty or one-hundred years, enacted policies that ensured that their emissions remained at levels that would have avoided harmful climate change altogether. If states would have done this, then their historical emissions would have been morally permissible, since the emissions would not have contributed to harmful climate change. Of course, had states learned at some later period that their emissions were contributing to harmful climate change, and if we apply the same fifty or eighty or one-hundred-year period, then perhaps states' historical emissions would have contributed to harmful climate change, and so would have been wrongful.

This creates another puzzle for how to apply (ERIE*) to states' historical

³¹ However, since the election of Donald Trump in 2016, both the United States' participation in the Paris Agreement and its regulation of greenhouse gas emissions under the Clean Air Act are now in serious doubt.

emissions. Let's return to the simplified case, *Soup*. Suppose that had Kay had stopped making soup after doing so at t_8 , the cumulative effect of the toxins would not have been sufficient to harm V. However, with her choice to make soup at t_9 , the cumulative effect of the toxins makes V extremely ill, which costs thousands of dollars to treat.

Suppose that for each time t_1 - t_9 , had Kay learned just prior to that time that making the soup would risk harming her neighbor, Kay would have made soup five more times before stopping. (Suppose that she needed to wean herself off the very delicious soup.) So suppose that the following counterfactuals are all true:

CF1: had Kay learned, prior to her first choice to make soup (at t_1), that making the soup would risk harming her neighbor, she would have made soup at t_1 - t_5 , after which she would have stopped.

CF2: had Kay learned, after at t_1 but prior to t_2 , that making the soup would risk harming her neighbor, she would have made soup at t_2 - t_6 , after which she would have stopped.

...

CF5: had Kay learned, after t_4 but prior to t_5 , that making the soup would risk harming her neighbor, she would have made soup at t_5 - t_9 , after which she would have stopped.

...

So notice that had Kay learned, any time prior to t_4 , that making the soup would risk causing harm, then V would not have been harmed at all. However, had Kay learned at any time after t_4 that making the soup would risk causing harm, then V would have been harmed.

It seems that Kay should *not* incur a duty to bear costs in virtue of her choices prior to t_5 , since all the counterfactuals in which Kay would have chosen to make soup at t_1 - t_4 are those in which those choices would not have resulted in harm and so would not have been wrongful. It also seems that Kay should incur a duty in virtue of her choice at t_9 , since the counterfactuals in which Kay would have chosen to make soup at t_9 are those in which that choice would have resulted in harm, and so would have been wrongful. The question is whether Kay should incur a duty in virtue of her choices t_5 - t_8 . Had Kay learned, prior to t_4 , that her soup-making would

risk causing harm, with respect to each choice t_5 - t_8 , either Kay would not have chosen to make soup or Kay's choice to make soup would not have been harmful and so would not have been wrongful. Yet had Kay learned, after t_4 , that her soup-making would risk causing harm, then Kay would have chosen to make soup at t_5 - t_8 and those choices would have contributed to the harm to V, and so would have been wrongful.

I think that Kay should incur a duty to bear costs in virtue of her choices at t_5 - t_8 . The truth of the counterfactuals in which Kay would have chosen to make soup at t_5 - t_8 and in which those choices would have been wrongful creates a relevant asymmetry between Kay (relative to those choices) and V, such that it would be fair for Kay to bear at least some of the cost of rectifying the harm in virtue of those choices. However, given that there are true counterfactuals in which Kay would not have chosen to make soup at t_5 - t_8 , it is plausible that the cost that Kay incurs a duty to bear on the basis of each of these choices is less extensive than, say, the cost that she has a duty to bear on the basis of her choice at t_9 , other things being equal.

Let's return to the circumstances of climate change. The claim that we are considering is that, for each time prior to 1990, had states learned that their emissions would contribute to harmful climate change, they would have continued to emit large quantities of emissions for an additional period of time—say, fifty or eighty or one-hundred years—at which time they would have enacted policies to reduce their emissions considerably. So if states had learned, at some early date (prior to the early part of the twentieth century, say), that their emissions would contribute to harmful climate change, they may have been able to avoid causing any harmful climate change, which would have made the production of their historical emissions morally permissible. On the other hand, if states had learned later (during, say, the second half of the twentieth century) that their emissions would contribute to climate change, they would not have been able to avoid causing climate change, and so their historical emissions would have been morally wrong.

If we assume that the above claims are true, then given my discussion of *Soup*, we can conclude the following. First, states have incurred duties of corrective justice in virtue of having produced historical emissions during the second half of the twentieth century. In addition, the duties of corrective justice that states have incurred in virtue of having produced historical emissions at later dates (e.g., the 1980's) are more extensive than the duties of corrective justice that states have incurred in virtue of having produced historical emissions at earlier dates (e.g., the 1950's), other things being equal. And finally, we can conclude that states have not incurred duties of corrective justice in virtue of having produced historical emissions prior to the early part of the twentieth century.

7. Conclusion

To summarize, I have argued that:

- (1) (RIE) is false because (ERIE*) is true. An ignorant causer incurs a duty of corrective justice to bear some of the costs of rectifying a harm or threat of harm that her action causes or contributes to causing when, had the ignorant causer known that her action would cause or contribute to the harm or threat, she would have performed a morally wrong action.
- (2) Had states known, prior to 1990, that their emissions would contribute to harmful climate change, it is likely that states would not have kept their emissions within morally permissible levels, given that once states learned, after 1990, that their emissions were contributing to harmful climate change, states did not reduce their emissions to morally permissible levels.
- (3) Therefore, it is likely that states have incurred duties of corrective justice to bear costs in virtue of having produced historical emissions.
- (4) However, given both (a) the path-dependence of fossil fuel use and (b) the possibility that meaningful action to avoid harmful climate change would have been delayed (rather than completely nonexistent), states may not have incurred duties of corrective justice in virtue of having produced historical emissions prior to the early part of the twentieth century.

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