Remediation and Respect: Do Remediation Technologies Alter Our Responsibility?

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ABSTRACT

In this paper we examine the relation between technologies that aim to remediate pollution and moral responsibility. Contrary to the common view that successful remediation technologies will permit the wheels of industry to turn without interruption, we argue that such technologies do not exculpate polluters of responsibility. To make this case, we examine several environmental and non-environmental cases. We suggest that some strategies for understanding the moral problem of pollution, and particularly those that emphasise harms, exclude an important dimension of morality. In lieu of these strategies, we employ the concept of *respect* to characterise the type of attitude that underlies many of our judgments about responsibility.

KEYWORDS

Restoration, pollution, climate change, geoengineering, carbon capture

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1. UNDOING HARM

In February 2007, the British businessman and philanthropist Richard Branson announced a prize of $25 million (USD) for research leading to effective methods of combating global warming. As the Washington Post wrote when the prize was announced, Branson's award is available to 'anyone who can come up with a way to blunt global climate change by removing at least a billion tons of carbon dioxide a year from the Earth's atmosphere' (Sullivan 2007). Branson, in other words, aims at environmental *remediation*; he seeks to undo actions that have already been done. Thus, the successful applicant will show that he or she can neutralise not just harms caused by pollution, but polluting *actions*, by returning the world to a state in which those actions had not occurred. The Branson prize is ambitious, laudable and vexing on multiple levels.

Given the apparently dismal prospects for meaningful reductions in carbon emissions – as substantial segments of the developing world stand on the brink of profound industrial transformations; as the Western world continues to develop and utilise energy-dependent goods – many view remediation technologies as perhaps the last best hope for restoring the earth's climate balance. Branson appears to be spearheading this charge, though there are many with similar aims. In an important article in 1997, written under the auspices of the Lawrence Livermore Laboratories, Edward Teller, Lowell Wood and Roderick Hyde, for example, proposed a set of technologies designed to deflect ambient radiation away from the Earth (Teller, Wood and Hyde 1997), thus undoing the effects of actions performed upon the surface. More recently, several companies and researchers, both before and after Branson's announcement, have been designing carbon-scrubbing or carbon-sequestration technologies that would remove carbon dioxide from the atmosphere (see, among many other sources: FAO 2004; Thom et al. 2002).

Branson's challenge, like proposals to remediate the overheating of the atmosphere through the deflection of sunlight, is considerable in scale. But there are also a range of everyday responses to pollution that express a similar logic of remediation. Pollution takes many forms. On a daily basis, we confront cases of pollution that involve the air, water, light, sound and heat. In more extreme cases, we confront harmful chemicals, and even radioactive agents. For each form of pollution there are many distinctive remediation strategies. At an everyday level, we remediate noxious odours through perfumes and counter-chemicals; we remediate highway noise through neutralising barriers; we remediate oil spills through the use of rubber booms.

In thinking about the structure of such responses, it is perhaps most accurate to describe them not as actions but as counter-actions. As remarked above, they seek to undo the undesirable effects of previously performed actions. In addition, such cases suggest distinctive strategies for understanding the role of human agency. We see, for example, that remediation makes no specific claims about the numbers or identities of the agents and counter-agents involved. Indeed, the most typical cases of remediation will involve sets of agents and counter-agents separated in space and time, and often unknown to each other. The distinctive structure of remediation thus invites discussion in two particular areas of philosophical interest. *First*, it encourages us to become clearer on the particular type of action that remediation constitutes. *Second*, it provokes difficult questions about the consequences of this type of action, or counter-action, for the assignment of moral responsibility. These two concerns guide us in what follows.

The possibility of addressing climate change and pollution through innovative remediation technology heralds a new era in research and public policy. It also creates a new and complex set of normative questions. Philosophers possess a range of concepts and techniques that can be summoned counterfactually, as a way of uncovering, and eventually promoting and shaping, the moral dimensions of technological change. These concepts and techniques can, for example, guide us in our approach to the genetic engineering of crops, or research into stem cells, or the use of ever more sophisticated forms of weaponry. But they can also operate along the dimension of what one might be obligated to do if a particular vision of the future comes to pass. The shaping of future practice around the availability of remediation technologies – the setting of human action within a larger framework that moves between action and counter-action, between doing and undoing – forces upon the philosopher a set of new questions about how to understand the nature of responsibility. Put differently, remediation technologies force the philosopher to ask: *In what sense are we culpable for our actions when the damage wrought by those actions can be undone through technological correctives?*

The underlying question in the following discussion is a simple one: *Is it permissible to pollute?* But attempts at an answer force us to think about what exactly such a question is asking, and what would count as a sufficient kind of response. In the case of pollution and other forms of action against the environment, the emergence of remediation technologies, such as those foreseen by Branson, put significant pressure on our intuitions about to whom or to what, or for whom and for what, we are responsible. Responsibility is not a discrete and easily graspable concept, but rather one part of

a ramifying network of moral concepts, ideas and practices, involving our notions of volition, respect, reward, punishment, authority and personhood. If remediation technology changes the way in which we hold ourselves and others responsible for what we do, it will *ipso facto* transform the network of concepts and practices in which responsibility functions.

Our concern in this essay is to show that a central, and we believe perhaps *the* central, feature of environmentally responsible action involves the matter of *respect*. The granting of respect, or the refusal of respect, underlies in many cases the ethical judgments that we make. By contrast, the emphasis in much of the popular and philosophical discussion of environmental restoration obscures the sense in which respect is at issue by foregrounding the idea that acts of pollution involve harms done to non-human nature. We do not wish to take a position here on the moral status of non-human nature – arguments which often, though not always, emphasise the notion of harm. The presentation of pollution as operating according to harms often conceals the sense in which polluting occurs within a more complex moral system, occupied, crucially, by other human actors. It will be enough if we can show that the attitudes we take toward others are sufficient to make polluting actions impermissible, even if the nature of those attitudes does not exhaust the reasons for which polluting is impermissible. For reasons we will make clear, consideration of remediation technologies has the peculiar benefit of allowing us to see more distinctly the relation between responsibility and respect.

We offer our argument in four sections. In the first section, we seek to lay the groundwork for our discussion by observing that the question we are asking falls at the intersection of two central concerns in the environmental literature: restoration and pollution. The issue is, in fact, quite distinct from a related body of literature in both areas. Namely, we seek to distance our position from the restoration literature by distinguishing between two concepts: (1) *restoration* and (2) *remediation*. We claim that the significant work in restoration ecology is not directly related to the more pollution-oriented questions of environmental remediation. In the second and third sections, we consider a number of examples, involving both pollution and everyday action, which demonstrate the significance of respect to determinations of culpability. Finally, in the fourth section, we briefly consider the ways in which our typical practices of assigning and managing responsibility suggest that remediation technologies should not serve as a means of moral absolution. Our argument throughout is that questions of moral responsibility are closely tied to the presence or absence of respect for other persons, and that

remediation technology does not mitigate the role of respect in managing our moral and social judgments.

2. REMEDIATION AND RESTORATION

We began by saying that we are interested, in part, in the particular type of action that remediation constitutes. We preface our discussion by distinguishing remediation from another category of environmental action more widely discussed in the philosophical literature, namely *restoration*. As many have previously shown, restoration is a complex form of agency (Higgs 2005; Light and Higgs 1996; Throop 2000). Though the ideal outcome in cases of restoration may involve the creation of a 'passable fake', attempts at restoration more typically lead to new environments that share substantial ecological and aesthetic properties with the original. As a class of action, restoration has received the majority of attention in the philosophical literature and has defined the contours of what has come to be known as the 'restoration debate' (Elliot 1997; Katz 1992; Light 2003; Light and Higgs 1996; Sagoff 1978). As one would expect, restoration refers to efforts to replace a damaged space with a simulated environment that is nearly identical to the original. The philosophical notion of restoration builds on everyday intuitions. When we speak of restoring a nineteenth-century house, for instance, we typically do not mean that we intend to enlist Victorian builders, or to fill our house with Victorian goods. We rather mean that we intend to enlist contemporary builders to *reproduce* the desired aesthetic with materials currently at hand. Similarly, when we speak of restoration as a form of environmental action, we refer to efforts aimed at *reproducing* or re-*creating* features that existed prior to a particular harm, generally in an attempt to restore value to the damaged area. Thus, we speak of the restoration of a waterway, and mean by this the re-introduction of native species, the filtering of the water, and perhaps the re-planting of the watershed. As Elliot and others have argued, the new environment here is a simulation of the original environment. Though the restored waterway may *look* like the original, and may contain the same *kinds* of plants, organisms and geographical features, a replaced environment is not, and cannot be, identical with the original environment.

If the logic of restoration is one of reproduction or re-creation, the logic of remediation, as we noted earlier, is one of counteraction and undoing. Remediation has received perhaps less attention in the philosophical literature, but remediation technologies, if successfully designed, have the potential to re-shape our relationship to the environment, and to each other,

in revolutionary ways. We have already seen a number of efforts to promote remediation as a strategy. What these various proposals share is the desire to return an impacted area to its original condition. Unlike projects of restoration, which aim to reproduce the old environment in new materials, remediation aims to return a space to the exact condition in which it existed before the relevant change, or harm, occurred. Thus, in the case of the carbon scrubbers proposed by Branson and others, the technology acts proximately to neutralise a pollutant at the point of emission. In the case of radiation deflectors, the technology acts remotely to offset the effects that would otherwise be triggered by the release of a pollutant elsewhere. Similarly, in the case of perfumes, with which we seek to undo the aesthetic effects of particular odours, or of neutralising sound barriers, or of rubber booms, we associate these technologies with acts of *de*-creation, rather than of re-creation.

In addition to constituting different classes of human action, restoration and remediation also differ along lines of moral emphasis. Discussions about restoration often focus attention on the nature of a harm done, and on the obligations, moral and otherwise, that we have to repair these harms. Very often, for example, discussions about waterway restoration will be preceded by a careful inventory of how the waterway has been contaminated, followed by a set of proposals for appropriate replacement strategies. Emphasis on harm in such cases is closely linked to assessment of the outcome of actions as good or bad. Our interest, by contrast, is in the ethical assessment of remediation. Where restoration raises a number of issues related to harms done, and appropriate forms of re-creation, remediation, as we have argued, introduces the possibility that we might alter our responsibilities through forms of counter-action. A fundamental, and we believe perhaps *the* fundamental, ethical aspect of environmental activity becomes obscured when we focus attention too heavily on the nature of the harm done. We thus distinguish between restoration and remediation, and intend to speak in what follows primarily of the latter.

Our discussion will consist of a number of examples of remediation that force into view our intuitions about the permissibility and impermissibility of certain categories of action. The conclusions we draw here have wider implications for moral theory as such, but we focus principal attention on the kinds of action that are typically understood as environmental. We make two quick observations: *First*, we recognise from the outset that there are no existing technologies that perfectly neutralise environmental damage. Pollutants will always intermingle with otherwise unpolluted objects and ecosystems, and there is as yet no way to mitigate every contaminant. But

our purpose is to draw out the properties of environmental activity that justify ethical analysis, and the current emphasis on restoration often acts to block out the features that we view as most significant. We therefore hypothesise in our discussion ideal remediation technologies that completely and perfectly remediate environmentally deleterious activity. *Second*, throughout this paper, we will be referring to 'pollutants' and using this term generally. It is important to note that different substances will affect different environments differently, sometimes acting as pollutants and sometimes not – for instance, milk is a pollutant when dumped into a river, but not when dumped into a bowl of cereal.

The question we wish to ask is whether technology can be said to alter our responsibilities. Put differently, it is this: if we can *correct* a wrong by flipping a switch, or by introducing a technology, does this then make our original act morally permissible? Sometimes the introduction of a technology clearly does make an otherwise impermissible act permissible. Coal energy, for instance, can purportedly be 'scrubbed up' through remediation technologies, thereby making it permissible (or at least, less objectionable). In such cases, optimists about remediation may believe that remediation technologies exculpate an actor from responsibility, or at least change the nature of the actor's decision. These *remediation optimists* may think that actions that are impermissible in the absence of remediation technology can become permissible when such technology is available. By contrast, *remediation pessimists* may believe that remediation technology should not significantly change the way we assign responsibility. We argue along such pessimistic lines.

Finally, before we turn to our series of examples, we want to say something briefly about alternative philosophical frameworks for thinking about pollution. Philosophical discussions of pollution can take a variety of forms. There are, for example, important philosophical questions regarding the nature of a pollutant (see, for example, Baxter 1974; Carson 1962; Hill 2004; McKibbon 1999; Soper 1995), questions which we might think of as primarily ontological in spirit. We do not make any significant effort in the present discussion to address such ontological issues. There is also substantial work characterising pollution in terms of risks (Beck 1995; Sunstein 2002; Thomson 1986a), as well as from the standpoint of cost-benefit analysis (Leonard and Zeckhauser 1986; Ruff 1970; Sagoff 2004), which we do not address. Rather, accepting that pollution may take many forms, our own philosophical interest is in the criteria we use to assign responsibility in instances where a generally recognised act of pollution has occurred.

We conclude our introductory remarks, then, by noting an important position in the literature on pollution that we oppose; namely the view, described above, that the central wrong-making feature of pollution, from an ethical perspective, is harm. The view is well articulated by Andrew Kernohan (1995), but is taken up throughout the risk and cost-benefit literature. Following Joel Feinberg (1984; see also Lyons 1969), Kernohan (2000) distinguishes between individual and accumulative forms of pollution. In the case of the individual, the question of ethical (and legal) responsibility is easily foregrounded: What is the ethical status of *this* act committed by *this* person? Many, and perhaps most, cases of damage to the environment, however, are caused by groups of persons rather than by individuals. More specifically, in many cases of collective pollution, the individual actions of each agent often do not rise to a level of damage sufficient to warrant ethical disapprobation, while the cumulative effect of many such acts surpasses the relevant threshold. In what follows, we are not concerned with the complex issues that distinguish individual from collective agency. But Kernohan's discussion is pertinent to the present discussion because it offers a popular philosophical strategy for assignments of ethical responsibility. Though Kernohan himself focuses on the question of how to determine the nature of rights held against collectives, he develops his conclusions in a way that presents *harm* as the principal consideration in such cases. Drawing a distinction between rights-based and harms-based criteria, he concludes: 'In cases of environmental harms, we can argue for the regulation of polluters by talking not of protecting people's rights, but of protecting harms to people's interests' (Kernohan 1995). In calling philosophical attention to the particular kinds of relations that exist between persons in cases of pollution, Kernohan's claim is congenial to our own analysis. Here, he concerns himself with the relation between the actions of 'polluters' and the interests of others. Nevertheless, in the cited remark, Kernohan is doubly committed to the concept of harm. He frames the ethical and legal status of pollution in terms, *first*, of harm to the environment, and, *second*, of harm to other persons. In what follows, we aim to change the framework in which such questions of pollution are addressed. Through the examples that we cite, we aim to show that, while harm is certainly *a* consideration in assignments of moral responsibility, we would benefit from an alternative framework in which the attitudes between agents are better taken into account.

3. POLLUTION AND REMEDIATION

We begin then with the premise that pollution is impermissible. We believe that what makes it impermissible is partly that it is (a) harmful to others and other entities, but also and more importantly, that it is (b) disrespectful of others. The latter is the more contentious claim, and we shall argue for it here through a series of examples. We surmise that harm to others is morally unacceptable *because* it is disrespectful of those others, but do not argue for that additional conclusion in this paper.

The difficulty we face in identifying the role of respect in determinations of moral responsibility is that we all too often focus on the aspects of examples that foreground harms done to the environment. The phenomenon that we wish to unearth, in contrast, becomes increasingly visible as we move from simple cases of pollution and contamination, to cases in which our attitudes toward others are more clearly at issue. We believe that cases of the former type exist on a moral continuum with cases of the latter type, and so that respect is equally at issue in all cases, though perhaps more difficult to discern in straightforward cases of pollution. Imagine first, then, one such straightforward case:

Pollutant: Jones dumps a pollutant into a river.

We call such a case 'straightforward' because we arrive at a judgment about Jones' action easily and without considerable reflection. Knowing nothing about Jones, his intentions, the specific location of his dumping, the nature of the pollutant, etc., most would agree that Jones has done something for which he is morally responsible. He has released a pollutant (presumably but not necessarily toxic) into the environment. Despite the quickness of our judgment, however, it becomes more difficult upon reflection to identify the particular aspect of Jones' act that justifies our judgment. A number of possibilities present themselves: Jones has caused harm; Jones has acted in a way unbecoming for a good citizen; Jones has not appropriately respected the land and its inhabitants; Jones has acted from bad intentions, and so on. How do we decide, then, between these (and other) alternatives?

In becoming clearer on the aspect of Jones' act that justifies our judgment, we can imagine a different case, in which a remediation technology is now available to counter an initial act of pollution:

Remediation: Smith dumps a pollutant into a river and subsequently introduces a technology to remediate the pollutant such that its effects are undetectable.

In this new case, we arrive at a judgment less quickly, and with greater uncertainty. Knowing nothing about Smith, his intentions, the location of his dumping, the nature of the pollutant, etc., it is not immediately clear whether to hold Smith morally responsible, and, if so, for *what* exactly we are so holding him. For the remediation optimist, *Remediation* is the paradigmatic case. By restoring the river through technological means, Smith is absolved of wrongdoing in a way that Jones is not. The remediation optimist, in other words, holds that the remediation technology not only neutralises the pollutant, but that, in so doing, it neutralises the moral status of the original act of pollution. His position is reinforced by the limiting case that we might call *No Emission*. If we install carbon- and sulphur-dioxide scrubbers on the tailpipes of our cars, many may believe that we have acted appropriately, and, indeed, would argue that we have not polluted at all.

The remediation optimist, therefore, has a ready response to the remediation pessimist who argues that *Pollutant* and *Remediation* maintain no morally significant differences. For example, the optimist may argue flatly that the reason that a remediation technology exculpates Smith of responsibility is because he has effectively not polluted at all. If the act of polluting is understood as the inflicting of harm, then the removal of that harm amounts to an evisceration of the act of polluting, removing the centrally significant feature of pollution. Put differently, according to the remediation optimist, there could be no significant moral difference between addressing pollution concerns *after* a pollutant has been emitted, as in *Remediation* above, versus addressing them *at the point at which* the pollutant is created. If remediation pessimists choose to argue that remediation technologies *do not* release us from our responsibilities not to pollute, then they must give a non-arbitrary reason as to why it is permissible to generate, but not to emit, some pollutant, but impermissible to generate, emit, and then *ex post facto* remediate the pollutant. In what sense, in other words, is the place of remediation, and the timing of remediation, relevant to the question of moral responsibility in relation to pollution?

Three cases illuminate the problem:

No Emission: I introduce a technology to address a pollution issue *prior to* dumping the pollutant into the environment.

Distance Remediation: I dump a pollutant with special magnetic properties. *Across town* I introduce a technology to capture the magnetised atoms of *that same pollutant*, such that its effects are undetectable.

Distance Remediation II: I dump a pollutant. *Across the country* I introduce a technology to remediate the spill such that its effects are, *in aggregate*, undetectable.

The optimist will ask whether we would be consistent in holding the first case to be permissible, but the second and third to be impermissible. If the outcome in each case is the same, what could account for the difference in judgment? The case is compelling; but we argue below, not compelling enough.

Of course, there are many strategies that the remediation pessimist may want to take in response. One would be to suggest that the *Distance Remediation* cases involve an element of risk, or offer the possibility of creating harms along the way. We find this strategy unpromising. The optimist can substitute non-harmful pollutants for harmful pollutants, and the intuitions we have about moral responsibility will be unchanged. Another strategy would be to suggest that the ambient nature of many pollutants makes distance remediation technologies imprecise; or that distance from source somehow distributes responsibility around a larger area. But the optimist's response to this may involve substituting timing for distance. In other words, the optimist could then argue that the pessimist must account not just for distance from source, but also for the timing of an act. Surely if I am permitted to create and then remediate a pollutant, then perhaps it is not the distance from the source, but the *immediacy* with which I remediate the pollutant. The pessimist must then also explain how timing too can account for a significant moral difference. Consider again the following *Timing Remediation* cases:

Instant Remediation: I dump a pollutant and *immediately* introduce a technology to remediate the spill such that its effects are undetectable.

Post Remediation: I dump a pollutant and *after some time* introduce a technology to remediate the spill such that its effects are undetectable.

When set along a continuum with the cases above, it seems implausible to hold that matters of distance or timing can carry such weight that they become principal moral considerations in assigning responsibility. Nevertheless, we argue that there *is* a morally significant difference between such cases, but strictly speaking not one that depends upon distance or timing. Rather, the morally significant difference will depend on whether the act adequately respects other affected parties. Once others are involved, as they are the moment a pollutant leaves an effluent pipe, the concerns of others

intermingle with the ethical permissibility of the act. Each of these cases therefore exhibits a level of disrespect to other persons who inhabit the shared environment that cannot be absolved by subsequent counter-actions. Though a subsequent action may neutralise the damage caused, and may separately be worthy of moral approbation, an act of technological remediation cannot repair the absence of respect in the original act. The burden, we believe, falls on the remediation optimist to tell us why carbon-scrubbers or radiation reflectors should, or could, absolve one of responsibility to act in a way that is respectful of those around us.

4. THE MAD HATTER

To see the flaw in reasoning of the remediation optimist, we turn to a set of examples of contamination that are not as obviously aligned along the axis between a human being and the natural environment. Here the sense in which the repair of harms resulting from a particular action does not absolve the actor of moral responsibility becomes increasingly visible. For the sake of clarity, we have chosen to use non-environmental, theoretical examples. This allows us to bring increased, though admittedly artificial, clarity to otherwise extremely complicated scenarios. However, we urge the reader to consider parallels between the examples below and real-world instances of remediation. Consider the following case:

Poison: I develop a poison that has the potential to kill you, but for which I have the antidote. Once the antidote is administered, there will be no ill effects.

Suppose I put this poison in your tea while we are chatting, fully intending to administer the antidote immediately once you have ingested the tea. Our intuitions in this case are straightforward and strong. I have done you wrong. But what kind of wrong have I done you? What justifies our judgment in this case? The remediation optimist will hold that, if the act is wrong at all, it is wrong in the sense that it might not be possible to repair the harm effectively, despite the availability of my technological remedy. In analogous cases of environmental action, they may hold, for instance, that an upstream pollutant cannot be satisfactorily remediated since there is always some sense in which downstream residents may have been subjected to an unacceptable risk. The wrongness of the act might, on this view, consist in the fact that I have put you at unnecessary risk. But consider instead:

Inert Additive: Before putting the poison in your tea, I mix it with the antidote, thus making the poison an inert additive.

Again, there seems to be something deeply wrong about *Inert Additive*, but in what specific sense? The distinguishing feature here is that I have introduced a substance into your tea about which you know nothing. The problem, then, may be thought to be epistemic: there is some additive, and we do not know or understand how inert this additive is. Even the remediation optimist will agree, perhaps, that *Inert Additive* is impermissible, but presumably because there is an epistemic barrier that prevents us from knowing whether technology can fully remediate the action in the intended way. In the real world, the implications are perhaps clearer. Without significant scientific data, few downstream residents would likely accept the risk of an allegedly inert pollutant being dumped upstream. In other words, what may be objectionable about the addition of an inert additive is that its inertness is unknown, so again, I put you at an unnecessary risk. But the combination of epistemic barrier and unnecessary risk does not adequately account for our judgments either. Consider:

Water Additive: Instead of introducing an inert additive to your tea, I add an extra teaspoon of water.

Many would agree, we think, that this case also appears morally impermissible. But now we cannot look to the notions of unnecessary harm, unnecessary risk or epistemic barriers to justify our judgment, and again we face the problem of what constitutes the wrong. Some will conjecture that the wrongmaking feature of my action is that I have watered down your tea, and so have produced an improper outcome: watered-down tea. They may hold, for instance, that even polluting industries emitting pure water through an upstream effluent pipe can be viewed as doing harm, perhaps by altering the salinity or the temperature of downstream water.

Suppose then that I alter nothing at all about your tea:

Tea Replacement: While you are not looking, I remove a teaspoon of your tea and replace it with a teaspoon of tea from the pot.

We also think it true that many would agree that *Tea Replacement* is morally impermissible, but not because I have put you at unnecessary risk, nor because there is an epistemic barrier that prevents us from knowing what the new teaspoon of tea will do, nor because I have produced an outcome that diverges from expectations. Rather, I have acted upon you without your knowledge, altering something that you will ingest without your permission.

For a more practical instance in which this could be viewed as impermissible, consider the case of the Arizona Snowbowl. In 2005, operators of a ski resort on US Forest Service land near Flagstaff, Arizona, planned to expand ski runs by creating artificial snow from 'reclaimed water' (or treated sewage). The land on which the resort is located is sacred to 13 Indian tribes, including the Navajo Nation. Not surprisingly, the Indian tribes sued to stop the ski resort from using reclaimed water to generate new snow (Archibold 2005).

As we have said, these examples operate on a continuum, and we begin to approach cases in which our intuitions shift. One such case:

Consent: After your sip of tea, you mention that the tea is too strong. In response, I offer to add some water. You consent.

Now the conditions under which the tea can be modified have changed substantially. Your consent has authorised me to take the same action as I take in *Water Additive*, though it now strikes us as morally acceptable. Or, to expand upon the Arizona Snowbowl case, we can see that if the 13 tribes had agreed that the snow was essentially no different than natural snow, and if they had consented to allow snow creation on their land, it would be far less contentious, perhaps even permissible. Indeed, we begin to approach categories of action that are not only permissible, but that are perhaps deserving of special forms of approbation:

Good Host: You ask for a cup of tea. I make the cup of tea, and then upon making the cup of tea, but before handing it to you, decide that the cup of tea is too strong. I add an extra touch of water.

Here, we believe, many would also agree that there is nothing problematic about what I have done, and that I have even perhaps exceeded the baseline expectations of my guest. You have asked just for a cup of tea; but I have done better and taken steps to make you a good cup of tea. Such capacity for action is exactly what we admire in a good host.

What, then, is the difference between *Water Additive*/*Tea Replacement* and *Consent*/*Good Host*? The difference we are seeking will be one that justifies the differences in our judgments and assignments of responsibility. Part of the difference, plainly, may appear to involve timing, as we mention above. Responding to a request for a cup of tea involves the creation of the cup of tea *in real time*, and these events can either be described separately or as one act, depending on the time at which they occur. If they are describable

as one act, then they are describable as an act that is either considerate of or inconsiderate of the interests of the tea drinker. And, not surprisingly, the differences in our judgment may also appear to involve a consideration of distance. As with timing, responding to a request for a cup of tea involves the *creation* of a cup of tea, and can also be understood as one act. The decisions that we take during the making of that tea are tied directly to the request for tea *here and now* and are not separate from the request for the tea.

To see the difference between *Water Additive/Tea Replacement* and *Consent/Good Host* better, it may be helpful to adopt a strategy from Judith Jarvis Thomson, in which we replace the harms in the previous examples with goods (Thomson 1986b).

> *Health Potion*: I have discovered an additive that will add years to your life. We are having tea.

Is it permissible for me to add health potion to your tea? We think not. I am not permitted to add a health potion to your tea without your permission, just as I am not permitted to add inert additives to your tea. Nor am I permitted to add a health potion to the municipal water supply. I am not permitted to add a health potion either to your tea or to the water supply without the unobstructed, and thus legitimate, consideration of all involved parties. Such cases of beneficent paternalism bring out even more strongly the sense in which the knowledge and consent of affected parties are integral to the moral responsibility of those who act. Just as I am not permitted to introduce harmful or inert additives, I should not be permitted to put a health potion in your tea, or, on a grander scale, in the municipal water supply, without the relevant kinds of permission from the involved parties.

One may believe, then, that it is strict *consent* that makes an action justified, but this is not so clearly true either. There are, of course, *many* conditions under which it may be permissible for me to add a health potion to the municipal water supply, perhaps even without the express consent of involved parties. Fluoride decisions are of this nature; and, to some extent, chlorination decisions are also of this nature. Both carry harms and benefits which should be weighed and evaluated by experts who act in the interest of the affected public, and do so in such a way that active members of the public have at least some say in the administration of their public health system. The reasons for such allowances are partly practical – coordination is a problem, and it is far less likely that members of the public will reject additives to their drinking water if their health is improved by these additives – but also justificatory, since the underlying moral requirement may only be that the interests of all affected parties be considered according to fair and

just political procedures, particularly if a public decision-making body, like a municipal water board, has been entrusted with the public health.

Our answer does, however, begin to reveal itself. *Health Potion* helps us understand that even if the effects of pollution are very good or non-evident, pollution is an act that involves impacting, affecting, and tampering with individuals who have and can articulate interests. Polluting the air or water supply of individuals without consulting them, even if clean-up is immediately on the horizon, involves an attitude of disrespect that ought to bear on our judgments about such cases. An act cannot be deemed justified if it has not been subjected to the appropriate procedures of justification. Our question for this paper, reformulated to address the concerns we have been discussing, is this: *Does the moral impermissibility of pollution stem from the harm caused by the pollution? Or does it stem from another feature of the act?* If one considers cases such as those given above, the fact that you may or may not be harmed by drinking the tea, or the fact that you may or may not be benefited by drinking the health potion, does not account for our judgments about rightness and wrongness.

5. RESPECT AND RESPONSIBILITY

We turn back, then, to cases of environmental action. Cases of remediation, we have argued, pressure us to anticipate the kinds of ways in which our determinations of responsibility will be impacted by technological change. Consider the following non-technological instance of remediation:

> *Intruder*: I enter your house without your permission, take your dishes out of your cabinet, use them, and then wash them, replacing them just as they were. I sleep in your bed, use your sheets, and then wash and replace them.

As with some of the cases above, the problem here is neither one of harm, nor knowledge, nor even of consent, but one of respect. I have used your belongings without your permission, and it matters not that the dishes and sheets sit on your shelves now just as they sat when you left the house. I have violated your person by entering your house, and I have acted in a way that is inconsistent with a relationship of respect between persons.

Many of the possibilities for technological remediation follow the basic logic of *Intruder*. The question in such cases is whether an initial act of disrespect to others can be neutralised through a subsequent act of remedia-

tion. But environmental action, which operates across distant spaces, and which involves not only human agents, but multiple industries, political institutions, ecosystems and organisms, is also inherently more complex than actions between two people.

The above examples bring out the forms of respect and acknowledgement that underlie assignments of responsibility, and determinations of permissible and impermissible behaviour, in everyday life. Though there are other features, such as consultation and consent, that justify some actions as permissible, such features are manifestations of a deeper commitment to the respectful treatment of others. In the sense in which we use the term in this discussion, to adopt an attitude of respect is to acknowledge that the other human beings with whom we co-exist have interests in the shared environment. In its literal sense, 'to respect' is to look again [*re* + *spicio*], to pause in what one is doing and to consider one's actions as they bear on the lives of other human beings. Actions we take against the environment, in the absence of procedures for demonstrating our respect toward the interests and attitudes of others, are actions against the others as well.

In that sense, the technological promise of remediation ought not to be mistaken as the moral antidote to disrespect. The hope that technologies might arise with the potential to undo acts of polluting carries with it too the risk that technology might be used as a means for circumventing deeply entrenched practices for determining which persons are responsible for which types of action. We remarked above that responsibility is not an atomic and self-enclosed concept. Rather, it involves a ramifying network of moral, social, political and legal concepts, the sum of which delineate at any given time our modes of holding people to account. Significant changes in the application of one concept will reverberate throughout the network.

In the case of remediation technologies, the remediation optimist foresees a time in which actions performed by one body are absolvable via actions performed by a different, and potentially remote, body, often in cases in which the actor is in no clear agreement of responsibility-sharing with the remediator. Returning to our original examples, the boundary between *Pollutant* and *Remediation* thus erodes. If the polluter can act permissibly when there is a technology available to undo his action, but which is neither designed, nor implemented, nor controlled by him, then we lose any clear reason for holding him responsible even in cases where there is no such technology available. In other words, the lesson of *Remediation* would then be that responsibility is an alienable feature of human action, and so actions performed from other places, and by other human bodies, can absorb the responsibilities of the original offenders. On the view of the remediation

optimist, it will not matter who performs a particular action, so long as someone, or something, is available to correct it. Though the precise relations of our concepts of action, personhood, volition, body and responsibility are deeply complex, we conjecture that the kind of change to assignments of responsibility anticipated by the remediation optimist would be devastating to that network, and would be disastrous for the very idea that human relations should be guided by principles of respect.

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