Ethical Obligations in a Tragedy of the Commons

BAYLOR L. JOHNSON

Department of Philosophy
St Lawrence University
Canton, NY 13617
Email: bjohnson@stlawu.edu

ABSTRACT

When people use a resource without a co-ordinated plan the result is often a tragedy of the commons in which the resource is depleted. Many environmental resources display the characteristics of a developing tragedy of the commons. Many believe that each person is ethically obligated to reduce use of the commons to the sustainable level. I argue that this is mistaken. In a tragedy of the commons there is no reasonable expectation that individual, voluntary action will succeed. Our obligation is not fruitlessly to reduce individual use, but to support a collective agreement to reduce everyone's use to the sustainable level.

KEYWORDS

Commons; ethical obligations; collective action; environmental ethics.

A commons is a resource whose use is shared by several parties. Heavy use of a commons can degrade, deplete, or even destroy it. The concept is usefully elastic. Thus it can apply to a place – a pasture or forest, the Antarctic, or even the Earth; a natural resource like a fishery or the Southern Ocean whale stock; or an abstraction like the world's biological diversity. Though the concept is applicable to manmade things, for example a commons room, I shall focus in this paper on natural commons.

Many modern environmental problems are commons problems in the sense that they are caused by overuse (or overexploitation) of some shared, subtractable resource. All humans, for example, use air and water, in multiple ways. They are, *inter alia*, used as sinks for waste products, and this use both degrades their quality for other uses (breathing and drinking, for example) and also has side

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effects on resources both private and common. (So acid precipitation damages structures, both public and private, and also damages biological resources like lakes and forests.)

What ought commons users to do when their aggregate use threatens a commons? More specifically, what is the right thing for them to do ethically?

Suppose, for instance, that someone understands the problem of global warming and the contribution that autos make to it. Can she in good conscience drive an SUV (i.e. any especially large gas guzzler)? Can she in good conscience drive at all? More specifically, is it morally wrong to drive, or to drive an SUV?

Are companies that make SUVs morally obligated to stop manufacturing them? Are they immoral for making cars of any type? Are they at least obligated to make cars whose environmental effects are tolerable in some long-term picture?

The answer widely believed is a Kantian one, that every commons user ought, morally, to restrict his or her use to a level that would be sustainable if all other users reduced their use in a similar way, and to do this regardless of what others do. So, unless the earth can tolerate everyone driving SUVs, no one should. If a commons is being degraded by aggregate use, then every firm and every factory ought voluntarily and unilaterally to reduce its emissions to the sustainable level (and to zero, if that is all that is sustainable).

While there is a kernel of truth in this answer, I think it is largely mistaken. It is mistaken because it fails to distinguish acting unilaterally from acting as one of many in a cooperative scheme to address a problem. At least in addressing commons problems, unilateral, voluntary actions typically have no reasonable chance of achieving their object. Collective efforts, by contrast, do not face the same systematic barriers. There is, of course, no guarantee that a cooperative solution to a particular commons problem can be crafted, but there is no systematic reason, of the kind faced by individual, voluntary efforts, to doubt that some collective scheme might succeed. If and when a cooperative scheme to avoid commons problems is in place, failure to adhere to it would normally be a form of free riding – an attempt to enjoy the benefits of others' sacrifices while avoiding one's own fair share of them. Free riding is immoral in the most standard and obvious ways. It is an attempt to gain an undeserved advantage by deception or force. If I am correct that unilateral action predictably has no reasonable expectation of success, then even though no one can rationally universalise use of the commons at unsustainable levels, no one has a direct moral obligation to restrict use of the commons to sustainable levels by unilateral action. Since collective, coordinated action faces no similar, systematic obstacle, and so has a greater chance of protecting the commons, one's moral obligation is to work for and adhere to a collective scheme to protect the commons.

I. THE TRAGEDY OF THE COMMONS

The term 'Tragedy of the Commons' (Henceforth 'T of C.') comes from a classic article of that same name by Garrett Hardin (1968). A T of C occurs when many *independent* agents derive benefits from a *subtractable* resource that is threatened by their *aggregate* use.

To say the resource is *subtractable* means that its supply of benefits can be depleted by overuse, and in the worst case, that the source of the benefits can be destroyed, as when an ecosystem or species is extinguished.

To say that the agents are *independent* means that they have no collective agreement governing use of the commons.[1] While each agent may take into account the likely actions of other agents, they have no agreed scheme for sharing use of the commons beyond mutual tolerance of mutual use.

To say that the commons is threatened by their *aggregate* use is to say that it is not threatened by each individual act of appropriation from the commons because no individual is using the commons at a rate that is unsustainable.[2] This is not a problem in which every individual act is harmful and the total of all these harmful acts is dreadful. Rather, individual acts are harmless in themselves, but harmful in aggregate.

For illustration I shall use Hardin's own parable, supposing that the agents are herders using a common pasture. Since each herder keeps all the benefits – meat, milk, wool, sale price, etc. – from each animal she pastures, each has a significant incentive to maintain or increase the size of her herd. And this incentive survives the realisation (if it occurs) that the pasture is suffering from overuse. For while each individual herder gets all the benefit from putting more animals on the commons, any improvement in the pasture that results from reducing her herd size will be shared with all other users. As a result, her individual share of these improvements will be quite small. Worse yet, even if many other herders show similar restraint, a small group (and at the limit, a single individual) can continue to increase herd size, thus appropriating the resources saved by conscientious users and undoing the good achieved by their restraint. This small group might include those who are less insightful about the damage being done to the commons, those who are too self-centred or short-sighted to care, and those who simply worry that at least some others will not restrain themselves and will thereby appropriate the resources saved by the sacrifices of others. The following table summarises the key motivational information:

EXPECTED PAYOFFS (X = Total number of animals using the commons)

	Cost to the individual herder	*Benefit to the individual herder*
Add an animal to the commons	1/X	1
Take a sheep off the commons	1	1/X

A rational herder therefore understands that her restraint will have a definite cost but produce a much smaller and less certain benefit. So in every decision about decreasing her herd size she sees that she will be worse off from decreasing her herd than from holding constant or increasing. The situation is nicely summed up by the phrase 'use it or lose it.' Resources foregone by the individual today are almost certain to be lost to some less enlightened herder tomorrow. Thus, at least where one's life or livelihood is derived from use of the commons, personal sacrifice to preserve the commons tends to be self-eliminating, as the scrupulous users lose their livelihood to the ignorant, the unscrupulous, or those who reasonably doubt that all will voluntarily reduce their use. Thus the rational herder sees that what is true in the short run is also true in the long run: merely reducing her own use of the commons to sustainable levels will have a definite cost to her, but will produce a smaller and much less certain benefit, all other herders see the same, and therefore there can be no reasonable expectation that unilateral reductions in use of the commons will be mirrored by enough other users to protect the commons.

II. THE REAL WORLD

Despite the analytical power of Hardin's parable, in the real world sharing resources does not always end in tragedy. People manage to escape from a potential T of C by a variety of stratagems, all of which can be grouped under what I call collective agreements and Hardin calls 'mutual coercion mutually agreed upon'.

In this paper I use terms like 'collective agreement' and 'cooperative scheme' interchangeably. In addressing modern environmental problems these will seldom if ever take the form of private person-to-person agreements. They will, rather, generally be legislation, or treaties between nations. Familiar examples might be green taxes, laws that regulate emissions, or treaties like the Montreal Protocol pledging nations to limit emissions of ozone-depleting chemicals. They are 'collective' or 'cooperative' at least in the minimal sense that they coordinate the behaviour of individuals to protect the commons. This is achieved by altering the incentives that commons users face, imposing sanctions on excessive use or providing incentives for decreased use. Both of these, in turn, increase the confidence of users that their own reductions in use will not be wasted, but will be mirrored by similar reductions on the part of others.[3] When these measures are adopted within democratic regimes, they are likely also to be 'collective' or 'cooperative' in the strong sense that they have the support of a majority of those affected by them.

As mentioned, despite the apparent inevitability of ruin implied by the word 'tragedy', Hardin recognises that a T of C can sometimes be avoided. The best way to reconcile the inexorable march to ruin implied by the word 'tragedy' with

the real world avoidability of ruin is to see that Hardin's parable, despite its folksy quality, implicitly relies on a game theoretical model. Given the implicit rules of the game – call it a T of C game – the march to ruin is inevitable. In the real world such disasters are frequently avoided because one or more of the defining rules of a T of C game do not hold.

Assumptions/Rules of a Tragedy of the Commons Game

1. The only incentive players have is to maximise benefits from use of the commons. (All benefits and losses are internal to the game.)
2. The only way players can communicate is by increasing or reducing use of the commons.
3. Use of the commons is shared, but individual herds are not.
   a. So *costs (to the commons) of increased use* are shared, but *benefits from increased use* accrue to the individual herder.

      Benefits (to the commons) of reduced use are shared, but *costs of reduced use* are borne by the individual herder.

   b. Resources saved by one individual are available for use by any other user.

Real people seldom have only one incentive, so rule 1 is unlikely ever to be true of the real world. But it may be approximately true when the benefits derived from use of a commons are large in comparison to any countervailing motives. This is especially likely to be true when the costs of overusing the commons appear uncertain, remote in time, or perhaps to fall primarily on third parties (like future generations), or when a firm's success or survival would be threatened by taking on a competitive disadvantage that less scrupulous competitors do not have.

Rule 2 may be approximated in reality when the number of users of a commons is very large and methods of communication are undeveloped. When commons users restrict their actions to voluntary, unilateral reductions in their use of the commons they impose this restriction on themselves, and this is the principal reason why such efforts have no reasonable expectation of success.

Rule 3a always holds in use of a commons without a cooperative agreement because it follows from the definition of an open-access commons (i.e. one whose use is not limited by a set of rules).

Rule 3b, like rule 3a, is definitive of an open-access commons, and so holds unless countervailing rules are adopted. In reality reductions in use of a commons by one person do not always encourage increased use by others. When, for instance, one person reduces her CO_2 emissions, there is no incentive for anyone else to increase his in response (as there is an incentive for others to increase herd size in response to increased water and forage on a common

pasture). It nevertheless remains true in real life that individuals who reduce use of a commons bear all the cost of their sacrifice while all users share the benefits, and that individuals get all the benefits of increased use, while the costs are shared with all users. Thus, especially where use of the commons provides a large benefit to the individual, the perverse incentives of a T of C are present in many real world situations.

In real life, T of Cs can frequently be averted because rules 1 and 2 of the T of C game do not hold. People usually have multiple motivations, including ethical scruples, concern for standing in the community, aspirations to make the world a better place, and fear of retaliation from others. Even more importantly, they also usually have ways of communicating beyond increasing or decreasing their use of the commons. The strategy of voluntary, unilateral reductions in use of the commons fails precisely because it limits one's communication with others in ways that mimic the T of C game and so produce its outcome. Relaxation of rules 1 and 2 permits commons users to pursue a collective solution to their problem that changes rules 3 and 4. Every successful collective agreement will adopt rules for use of the commons, together with monitoring of use and sanctions for noncompliance that alter the incentives for users. When use of the commons is successfully regulated by appropriate rules, all commons users are reasonably assured that their restraint will preserve a proportionate share of resources for their own future use and that overuse will result in costly sanctions rather than windfall benefits. Hardin calls these collective agreements 'mutual coercion mutually agreed upon', but while some people may need to be coerced into cooperation for the common good, others may cooperate willingly, so his terminology reflects personal taste rather than analytic precision.

III. MORAL OBLIGATIONS IN A TRAGEDY OF THE COMMONS – THE STANDARD ANSWER

What should a person do in a T of C? More specifically, what ought such a person to do from a moral point of view? The standard answer, the one that most people seem to accept, is that what each person ought to do is to reduce his or her use of the commons to sustainable levels and that this is true whether or not others can be expected to do so also. We should (morally) do what we believe that everyone should do, and do so whether or not we believe others will actually do the same. It isn't right, after all, to follow a mob to do evil, and deeply engrained social practices can be morally wrong – slavery, for example – and it is the responsibility of individuals to resist the common wisdom and the material temptations, and to take the right stand however lonely and however costly it may be. So, too, in a T of C, most people reason, one should do 'the right thing', which is to reduce one's use to the level that all could adopt while preserving the

commons, and one should do this without regard to the behaviour of others or the costs to oneself.

If this answer is correct, and if the situations I described in my opening are indeed T of Cs, then the answer to each of my opening questions is clear. No, we should not drive SUVs, or cars at all, unless the commons – in this case the biosphere – can sustain them for everyone, which is very doubtful. Yes, companies that pollute the commons beyond sustainable levels are acting immorally, just as manufacturers who enable us to consume beyond sustainable levels are.

By now it should be clear why I think voluntary, unilateral reductions of use have no reasonable expectation of success when the situation faced strongly resembles a T of C in other respects. It is very unlikely that most commons users will adopt such widespread restraint without organised assurances that others will mirror one's own restraint. The reasons are those given above: the incentives users have in such cases; each user's knowledge that her restraint is likely only to reward less scrupulous users; each user's awareness that every other user sees the same discouraging prospect; the need for nearly universal restraint in order to effectively protect the commons or reassure users that their sacrifice is not in vain.

The only reason to adopt unilateral restraint, however, is to avert a T of C. So if unilateral restraint cannot reasonably be expected to achieve its purpose, there is no reason, and hence no moral reason, to adopt it. (I shall qualify this claim later.) I claim that averting a T of C is the only reason for adopting unilateral restraint because in a T of C there is nothing wrong with any one person's use of the commons. No one person's use is large enough to harm the commons. Harm results only from the aggregate level of use. (My argument is not meant to apply to atypical cases in which one individuals' use of the commons is great enough to damage the commons independent of others' use.)

I will now consider some objections to this thesis.

IV. SOME OBJECTIONS ANSWERED

First Objection. I have argued that a user of the commons can control only her own use, not that of others, and that she has no obligation to refrain from use, since she cannot by her actions prevent others using and destroying the commons. Someone might object that by parallel reasoning, no one has an obligation to refrain from murder. For no murderer can, by his own restraint, prevent other people from committing murder. So despite his restraint, many may still be killed. Thus if commons users have no obligation to restrain their use of the commons to sustainable levels, neither does a murderer have any obligation to restrain his murderous impulses.

This reasoning is mistaken, for the two cases are not really parallel. Whereas by hypothesis no individual's use of the commons is harmful, every act of murder has an immediate victim who is harmed by it. The problem of murder is greater in aggregate when more acts occur, but every murder is harmful and wrong, regardless of the actions of others. By contrast, in a T of C, no act of appropriation from the commons is harmful in itself. Thus a murderer is morally obliged to refrain from murder whatever the acts of others because what she does is harmful and wrong independent of the aggregate harm done by her act together with others like it, and because her restraint will by itself prevent a wrong and harmful consequence. A user of the commons, by contrast, is morally obliged to reduce her use of the commons only because of the actions of others (which aggregately damage the commons) and only if her restraint will prevent a wrong and harmful consequence. I have argued that she cannot reasonably expect that unilateral restraint will prevent (or contribute to prevention of) the harm at which it is aimed, and thus it follows that she has no moral obligation to unilateral restraint. She is obligated to reduce her use of the commons only as part of a scheme that can reasonably be expected to secure protection of the commons, and this means a collective scheme in which her actions are coordinated with others'.

Second Objection. Suppose that a murderer kills by administering small doses of a poison over time. Suppose no individual dose is harmful by itself, though aggregately they are fatal. Does it follow by reasoning parallel to that I have advocated that the murderer has no moral obligation to refrain from poisoning?

Certainly not. The commons user does not control aggregate us of the commons by her actions, and she can have no reasonable expectation that her unilateral reduction in use will prevent (or contribute to prevention of) harm to the commons. By contrast, the poisoner controls the aggregate dose by controlling each individual dose, and he can know with certainty that he can prevent the harm his aggregate dose would do by his unilateral action.

Third Objection. Consider one final case. Suppose people can throw a pebble onto a pile building up on an innocent person. No individual's pebble harms the person, but if enough people cast a stone, in aggregate they will crush him to death. If each person acts independently, then just as in the commons case, no person's restraint controls the aggregate amount and no one's unilateral restraint can reasonably be supposed to prevent (or contribute to prevention of) the harm. If my reasoning about the commons is correct would it not follow, contrary to our ordinary moral intuitions, that no one has an obligation to refrain from stoning the victim?

This case more closely parallels my reasoning than did the others, and distinguishing it will reveal important ideas about the commons. Three parallels with the commons case clearly hold. These are as follows:

(1) No individual contribution produces harm.

(2) The harm is a consequence of the aggregation of many separate actions.

(3) No individual can prevent the harm by unilateral action.

There are three other features, however, that might differ from the typical commons case from which my argument is derived. In a tragedy of the commons, the following three features are also found:

(1*) Each individual stands to benefit considerably (in the short run) from continuing to use the commons above sustainable levels, and will, conversely, lose appreciably from refraining.

(2*) One person's reduced use of the commons is likely to encourage others to increase use, so that her restraint becomes in effect a reward to those who are less scrupulous.

(3*) There is no collective agreement to prevent the aggregate harm by individual acts of restraint.

If all of these features were present in the pebble case, then I believe the two cases would be parallel, and my position would commit me to saying that no one has a moral obligation to refrain from throwing his pebble. So my response to this challenge depends on claiming that these features are unlikely to hold in the pebble case, or that if they do, this excuses the individual action that would normally be morally wrong. I shall discuss each of the three in turn.

*Feature 1**. We can imagine that 1* holds in the pebble case or that it does not. If it costs an individual little or nothing to withhold her pebble, and if she understands that throwing it on the pile will contribute to killing someone, then, *ceteris paribus*, it seems clear that it would be wrong to cast it onto the pile. Similarly, if users of the commons have little to gain or lose from reducing their use, then the case that each of them should do so unilaterally is strengthened. This is so for two reasons. First, if there is little at stake, the odds that enough people might unilaterally reduce use in hopes of preventing damage to the commons are increased, since people will do what is easy more often than what is costly to them. This obviously means that there is a greater chance that one's unilateral action will actually be part of a group effort that protects the commons, and so there is some good reason to take the action. Second, if the cost of restraint is small, then there is less reason for the individual to continue to use the commons, so even an improbable gamble on unilateral action is more easily justified. This follows from standard reasoning about wagers. Though numbers cannot be assigned in this case, a wager whose payoff is fixed becomes more rational as either the odds of the payoff increase or the cost of the wager decreases. So if

either others are more likely to do what is necessary to protect the commons (odds of the payoff increase) or the cost to the individual of restraining use of the commons unilaterally in hopes of contributing to its protection decreases (costs of the wager decrease), then this action becomes more rational.

Suppose, however, that individuals stand to gain significantly from tossing pebbles, or to lose significantly by abstaining. Suppose, for example, that the local dictator threatens to imprison or kill those who refuse to participate, or to harm their families. In such a case it is obviously less likely that many individuals will abstain unilaterally thereby saving the victim. As a consequence, the practical point of any one individual's abstention is less, since the victim is likely to be killed no matter what the individual chooses. In this event, whereas I would admire the moral courage of a person who nevertheless refused to participate in the stoning (especially if the consequences were visited upon her alone, and not upon her innocent family), I would also tend to excuse those who participated. That is, my judgment would be harsher toward someone who threw on a stone when she could have refrained at little or no cost, than it would be for someone who threw a stone knowing that her restraint could not reasonably be expected to save the victim, while it would result in grave harm to her or to other innocents.

The latter case (where restraint is costly) is the one that parallels the typical commons situation. In judging it, I feel moral tension. On the one hand, it is difficult to say that a person who knowingly participates in the killing of an innocent person is blameless, even in the difficult conditions described. On the other, I am inclined to make allowances for the difficulty of the conditions and to see the responsibility of the participants as diminished because of those conditions. In this I draw on a long tradition that goes back in the literature at least as far as Aristotle's discussion of whether a ship's captain who jettisons cargo to save his ship in a fierce storm has acted voluntarily and so responsibly (Aristotle, 1966: 1110a). The tradition generally allows for a defence that while what one has done would otherwise be blameworthy, one has acted reasonably and with diminished fault in the circumstances. With regard to the commons, I conclude that the moral judgment must be similar. Considered in isolation this condition (unilateral reduction in use is costly to the individual but has little chance of contributing to protection of the commons) diminishes but does not by itself remove one's moral obligation to make such a reduction.

*Feature 2**. It is easy to imagine circumstances in which a parallel to 2* holds in the pebble case. Suppose the dictator offers a reward for each pebble tossed, so that those pebbles dropped by non-participants are likely to be picked up and thrown by less scrupulous persons. If even one person is unscrupulous (and tireless) enough, he can kill the victim by throwing enough stones alone. If the village idiot does not realise that all these stones will kill the victim, he might keep throwing them to collect the rewards, even if no one else did. If we imagine that no participant knows what decision the others are making, then we can even

suppose that there is someone who would refrain if he thought others would also do so, but who is unwilling to pass up the reward when he thinks that his restraint will only reward the less scrupulous or less enlightened, and thus he alone throws enough stones to kill the victim in the mistaken belief that others are also throwing many stones. In such circumstances every rational person will see that her own refusal can contribute to saving the victim only if such refusal is universal, and that, given the ordinary mix of human nature, this cannot reasonably be expected. Thus she will see that her own unilateral actions will entail a cost to herself (either loss of the reward if 2* holds alone, or both punishment and loss of reward if both 1* and 2* hold), with no reasonable expectation of a good result, and hence she will be less likely to refuse to participate.

What is the moral significance of these considerations? Greed does not excuse one from moral obligations, and since I think we have a moral obligation not to contribute knowingly to the death of innocent persons, I would not argue that the promise of a reward excuses throwing of pebbles. But the line between reward and punishment is often uncertain. Suppose, for instance, that potential stone throwers cannot afford the basics of existence for themselves or for others who depend on them unless they claim the reward offered for tossing a pebble. In that case one need not be greedy to be tempted, and those who choose the reward, knowing as they do that their own restraint will not only entail serious losses, but that it cannot be expected to produce any good consequences, would have my sympathy.

I conclude that the mere fact that one must forgo a reward if one reduces one's use of the commons unilaterally plays little role in explaining why one has no moral obligation to do so. By contrast, if users must make a significant sacrifice, that would play a larger role in diminishing their moral responsibility. Taking an extreme, if other things are equal and one must choose between one's own death and that of another, or the death of some stranger and the death of someone close to us, it seems plausible to say that one has a right to choose to preserve oneself or the person close to one. I interpret this as an application of the principle that our moral responsibility to preserve the stranger is overridden by our moral right to preserve ourselves and those close to us, or more generally that a *prima facie* moral obligation can be overridden by the sacrifice it would entail.

*Feature 3**. I come now to 3*, which I think is the most significant of these three features. It seems clear to me that in the pebble case we have already a collective agreement that one should, other things being equal, refrain from actions that will contribute to the harm or death of other innocent parties. Thus we have a collective agreement that one should, other things being equal, refrain from casting pebbles onto the pile. In fact, as a description (I am not offering a meta-ethical theory here) of how they function, widely accepted moral beliefs are collective agreements about one's obligations in a particular kind of situation. It

is because we have such agreement that I could appeal to our intuitive moral sense that one should, other things being equal, refrain from actions that cause harm to an innocent person, and *a fortiori* that one should refrain from actions that cause his death.

By contrast, in the typical commons case, no such collective agreement exists.

The commons problems with which I am concerned (as opposed to problems of free riding on an established agreement in a commons), occur when conditions change so that use of a commons that was previously sustainable is seen to endanger it. Increased exploitation might endanger it, or other changes might decrease its ability to recover from use rates that were previously sustainable. Because of this, there is no pre-existing agreement about what is permissible. Heretofore individuals have been free to do what they wanted in the commons. Now that same behaviour threatens the commons. Even if awareness of the threat is widespread, agreement that one now has an obligation to refrain from previously permissible actions may be slow to emerge.

As an empirical example, think about public attitudes toward the activities producing greenhouse gases and other environmentally destructive emissions. Though many engage in self-serving denials, most people in the developed world have at least a dim awareness that their emissions are problematic. Most in the environmental community recognise that present practices are unsustainable in the long run. And some in that community believe that present practices are immoral. But it would obviously not be true that there is a public consensus that present practices must change, and still less that they are immoral.

Feature 3* seems to me to be the one of the three considered that does the heavy lifting in distinguishing a typical commons case from the pebble example, and in explaining why no one has a moral obligation to reduce use of the commons unilaterally. There is a vast difference between (a) free riding or otherwise failing to live up to an existing (and functioning) collective agreement that produces benefits, and (b) refusing to act unilaterally in the way one would like to see universalised when that is costly to oneself and cannot reasonably be expected to produce the outcome whose pursuit justifies one's action. The former is a paradigm of unethical behaviour. It may sometimes be forgiven. One's obligation may be diminished by special circumstances (such as the weight of the sacrifice demanded). But the *prima facie* obligation remains, forgiven, diminished, ignored, or fulfilled. By contrast, in the absence of the collective agreement that would give one's restraint a chance of securing its object, there is no point and no obligation to make the sacrifice that restraint entails.

In the pebble case we have a pre-existing agreement that one should, *ceteris paribus*, refrain from harming (or contributing to the harm of) innocent persons. This explains, I think, why we feel clearly that throwing pebbles is wrong, and that at best it can be understood or forgiven.

In the typical commons case, while there may be good reasons justifying an agreement about how individuals should act, and while such an agreement would give rise to a moral obligation to abide by it, in the absence of the agreement, no one has an obligation to beggar herself without purpose. One is obligated to make sacrifices for the common good, but no one has an obligation to make sacrifices without purpose, and in the circumstances of a T of C, including the absence of an collective agreement about how individuals should act to protect the commons, reducing one's own use to the sustainable level is a fruitless sacrifice.[4]

V. OBLIGATIONS IN A TRAGEDY OF THE COMMONS

Though there is no reason, moral or prudential, to make fruitless sacrifices, one still has both moral and prudential reasons to try to protect the commons on which shared welfare depends. The mistake is in thinking that one's obligation is to act unilaterally, not in thinking one has a moral obligation to act.

The belief that one should make unilateral reductions in one's use of the overused commons may be a reflection of the religious belief that one's chief concern is the welfare of one's own soul and that the practical consequences of one's choices are secondary. Or it may be a result of confusing one's obligation to uphold a collective agreement that serves the public good even when that choice is difficult and costly – casting one's vote, for example, though it is only one among millions, or refusing to lie or steal, even though one would benefit and is unlikely to be found out.

In a T of C, one acquires those obligations – to reduce one's overuse – as a result of a collective agreement that gives point to that forbearance. The obligation does not predate the agreement. Although any successful collective agreement will have provisions for monitoring and sanctioning to reduce free riding, these alone are not likely to be sufficient. The agreement will probably fail unless most participants recognise a moral obligation to abide by it even when they could ride free without detection.

The agreement itself must also be arrived at first, and agreements are not self-creating. They are forged by the efforts of individuals who sacrifice time and effort, and who may take other risks as well. This, then, is our first obligation: to work for a collective agreement that could avert a potential T of C. And this may involve unilateral actions since someone must be the initiator.

The obligation to organise derives from a more general obligation to promote the common good. It is what Kant (1991) called an imperfect duty since there is no way to specify exactly how much time and effort one is obligated to spend working for a collective agreement.

It is sometimes thought that organising a collective agreement to prevent a T of C involves a regress problem because the dynamics that threaten to create a tragedy in the first place also stand in the way of achieving a collective

agreement. This, however, is mistaken. While there can be no guarantee that organising efforts will succeed, while the temptation to ride free by leaving the organising efforts to others is always present, and while the ignorance of those who do not see the impending tragedy may be an obstacle to a collective agreement, organising efforts do not face the most intractable features of a T of C. In particular no one can misappropriate the benefits of one's organising efforts in the way that one party can appropriate the resources saved by another's forbearance in a commons. As a result, organisers need not see their efforts as likely to reward the less enlightened, nor as providing a systematic temptation for others to nullify them in the way that commons users seeking to save resources by individual initiative may legitimately see their efforts. Even more importantly, in a T of C game the possibilities of communication between users are, by definition, limited to decisions to increase or reduce use of the commons. But organising efforts face no such artificial limits on communication. Those who restrict their efforts to individual decisions about the rate of their use of the commons thereby limit what they say to others. To begin to organise is, by its nature, to begin communicating with other commons users in all the other ways available: informing them about the danger, appealing to their self-interest as well as their concern for the common good, seeking and suggesting ways of regulating use, of promoting an agreement, and of enforcing one on the reluctant and the would-be cheaters.

This, then, is the 'truth' in the position I have opposed, the position that one is obligated to reduce one's use of the commons unilaterally, without regard for the actions of others. One has an obligation in an impending T of C, and it is to 'do the right thing' without waiting for others. 'The right thing' is not, however, a fruitless, unilateral reduction in one's use of the commons, but an attempt to promote an effective collective agreement that will coordinate reductions in commons use and therefore avert the aggregate harm. When such an effective agreement is in place, then one has an obligation to abide by it even if one suspects that some others will free ride, and even if it is costly to one's self interest. Such individual forbearance is almost always an essential part of a successful collective agreement, and is a paradigm of ethical obligation. It is not, however, to be confused with one's obligation in an impending T of C, when such unilateral reductions are ineffective and wrong-headed.

VI. SOME QUALIFICATIONS

I promised earlier to qualify my thesis. I have argued that unilateral reduction in one's use of the commons is ineffective in averting a T of C, and therefore that it is not ethically obligatory. I have not argued that such reductions in use are, typically, immoral or unethical. They may be so if they severely deprive oneself, or other innocent persons who depend upon one, and they may be so if they

become a substitute for organising efforts. Provided, however, that they do not have these consequences, individual reductions are surely morally permissible, and perhaps even praiseworthy as supererogatory actions.

Indeed, there are at least three good reasons to undertake such unilateral reductions in one's use of an overburdened commons. The first is that it may make one feel good, while doing no harm. While organising efforts can seem impersonal, slow moving, and uncertain, when one reduces one's own burden on the natural environment, one knows that one has done something concrete and immediate. I have argued in this paper that there is little reason to think that our environmental problems will be solved by these kinds of individual, voluntary efforts, but this does not mean that they do no good at all. They contribute, typically, a drop in the bucket, and we deceive ourselves when we think of them as analogous to the small contributions we make when we vote, or do a kind deed. Voting has a point because it is part of a collective effort, and kind deeds have immediate beneficiaries, and so both stand in contrast to ill-aimed efforts to prevent aggregate harm by unilateral efforts. But if individuals feel better because of making these individual sacrifices and are encouraged to persevere with the more important efforts to contribute to collective agreements, there is typically no reason to object to them.

This claim is strengthened by a second reason for undertaking such individual reductions, which I shall call 'pioneering.'[5] We need to work out new ways of living within the biosphere, and individual reductions in one's burden on an ecosystem can constitute exploration of alternative ways of life. Although full solutions to our environmental problems will almost certainly require restructuring of whole systems, those who have pioneered may show where changes are most needed. Those who have lived without autos, for instance, may know best where public transit is most needed, as those who have tried solar design houses can best tell us whether, and with what adaptations, they are actually viable in a given area. Further, there may be rare cases in which technological innovations available to individuals can actually solve environmental problems, and in these cases individual purchase may strengthen the chances that a purely voluntary solution will be adopted.

A third reason for individual reductions is that it may be necessary as part of organising efforts. Those who are persuaded by the argument I have given will reject the following view, but it is still true that many people think it is hypocritical to argue that everyone should collectively undertake changes that the individual has not willing undertaken already. Making individual reductions, therefore, may be necessary to convince others of one's sincerity and of the viability of what one proposes. Beyond this it may set an example for others and impress them with one's commitment and understanding. So as an aid to one's organising efforts, there may be a place for exemplifying the kinds of changes that one urges on others as part of a collective agreement.

VII. CONCLUSION

There are many reasons why people believe that individual sacrifices are the proper response to a T of C. They confuse such actions with individual contributions to collective efforts like voting or pulling one's own oar in a boat. They confuse unilateral reductions in use with abstention from actions that cause immediate, individual harm, like killing and stealing. The view may be reinforced by consumer society, which encourages us to focus on sources of satisfaction that can be purchased by individuals rather than those achieved by coordinated effort with others. Not least, the belief that our obligation is primarily a personal one to reduce our own use of the commons can be comfortable. If we become involved in organising activities, we lose a certain amount of control. Others may urge us to give more – of our time, of our money – than we had planned. We may have to deal with other people in ways we find unfamiliar or unpleasant. And the process can seem interminable and therefore frustrating. It may seem, it may even be, that we are making no real progress toward our goal. By contrast, unilateral reductions in our burden on the commons are wholly within our control and hence we decide exactly how much we are obligated to do. No one badgers us to turn the heat down further or buy a still more efficient auto. And in contrast to the often frustrating uncertainty of collective efforts, individual reductions are satisfyingly certain and concrete.

For all these reasons, individual reductions are seductively inviting as a focus for our concern about threats to the natural world. If my argument in this paper is correct, however, it is a seduction we should resist. I have argued that it is a mistake to see our primary obligation as unilaterally reducing our individual burden on the environment. I have couched this in terms of a commons in order to make use of the well known and powerful reasoning that Hardin developed in discussing the Tragedy of the Commons, but it should be clear that my main concern is not with pastures but with consumer decisions, one's attitude toward polluting industries, and the like. Hardin's reasoning makes it clear why it is unreasonable to expect such uncoordinated acts of supposed virtue to achieve their object. We need to focus our efforts in the political sphere, working for changes in the socio-economic structure that will change aggregate behaviour, and thus have effects of the magnitude needed to match the magnitude of the assaults on the integrity of ecological processes. Similarly, I believe, we must accept that we cannot expect companies to undertake costly environmental protection plans voluntarily, for they thereby put themselves at a competitive disadvantage that may only undermine their viability.[6] On the other hand, those individuals and firms that actively oppose collective agreements that could 'level the playing field' and effectively address the commons problems that we face do fully deserve our condemnation. The dangers are real, and those who seek to benefit in the short run at the expense of the larger public, including future generations, are at best misguided, and at worst immoral.

NOTES

[1] An effective collective agreement would establish rules for use of the commons, a method for monitoring compliance with the rules and sanctions for non-compliance, and a mechanism for amending all of these as required. Such an agreement can be quite formal, or merely customary. See E. Ostrom (1990).

[2] This is typical in potential T of Cs. This paper is not concerned with atypical cases in which individual agents exceed sustainable rates of use of a commons.

[3] Privatising a commons, either by giving property rights to the whole to one individual, or by carving it up into parcels whose property rights are assigned to multiple individuals, is a special type of collective agreement. It is a collective agreement in that property rights are recognised and enforced by the collectivity. It alters the incentives of commons users because they acquire exclusive use of some portion of the commons and so can reasonably expect that their reductions in use will result in offsetting benefits for themselves. It is special since the scheme does not require cooperative reductions in use by others.

[4] In *Reasons and Persons* Derek Parfit has addressed a number of the same issues that I take up in this paper. So far as I can see we have no important disagreements. Importantly his Fisherman's Dilemma (esp. pp 110–103) is a typical T of C, and in discussing it he too endorses the claim that no one has a moral obligation to reduce use of the commons without a reasonable expectation that enough others will do likewise to gain the benefits that only shared restraint can obtain. I am indebted to an anonymous reviewer for *Environmental Values* for bringing Parfit's work on similar issues to my attention.

[5] I owe the term 'pioneering' to Faye Duchin.

[6] Firms can, of course, judge that environmentally desirable actions are in their competitive interest, perhaps because they will appeal to some consumers or perhaps because the firm anticipates that such actions will be necessitated by legislation or supply shortages in the future and that the firm will be better able to compete by advance preparation for these developments. Support for collective action to protect the environment encourages the latter kind of action. Conversely, such moves are discouraged when anticipated agreements are undermined, since those who took early steps have incurred costs that will not normally be compensated by the market.

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