

Sharing the Earth: Sustainability and the Currency of Inter-Generational Environmental Justice

Allen Habib
The University of Calgary
Calgary, Alberta, Canada
2011

Abstract:

Philosophers typically understand environmental sustainability as a duty of distributive justice between the generations of the earth. Since every generation is equally entitled to the bounty of the natural environment (the thinking goes) every generation should have an equal share of that bounty. But since generations precede each other in time, it is the duty of earlier generations to ensure that later generations receive their fair share. Acting sustainably is the way of meeting this duty, since sustainable practices are those that (ideally) preserve the environment for the future.

But what is 'equality' between shares of something as complex, varied and dynamic as 'the environment'? How are we to value nature for the purposes of measuring 'equal shares' of it? I think the answer to this questions lies in the difference between sharing something by parts, like a pie, and sharing something by turns, like a bicycle. The generations share the earth by turns, not by parts, and so questions about equality of shares are questions about turns, not parts. We need to ask what constitutes a 'fair turn' with the earth, and for that question we don't necessarily need to be able to commensurate the various parts of nature, just as we don't need to know the relative value of the parts of a bicycle to say what constitutes a fair turn with it.

- - -

1. Sustainability and the Currency of Inter-Generational Environmental Justice

What do we owe future generations of people, morally speaking, concerning nature and the environment? This question lies at the intersection of two more general investigations, one on the nature and structure of inter-generational justice *tout court*, the other on environmental ethics and our duties regarding the natural world. The confluence of the two comes under the (inter-disciplinary) heading of environmental sustainability theory.

Since its introduction by Rawls in the 1970's¹, inter-generational morality has very often been cast in terms of distributive justice – i.e. as a matter of the fair distribution of some good or goods between the members of a 'community of justice'. Rawls' insight, taken up by Robert Solow² and other economists almost immediately, was to tun the distributive model he

1 J. Rawls, *A theory of Justice*, Harvard: Cambridge, (1971). See pp. 284-293

2 R. M. Solow, "Intergenerational Equity and Exhaustible Resources", *The Review of Economic Studies* 41, (1974), pp. 29-45. This volume was special edition dedicated to the issue of exhaustible resources and inter-generational justice, containing work by Dasgupta, Stiglitz and Heal as well as Solow, giving us an idea of the alacrity with which economists took up Rawls' suggestion.

pioneered towards the future, and to conceive of the question as one of the proper distribution of goods between people at different points in time – a community of the past present and future, as it were. On this framework then, what we owe future generations is a fair share of some crucial good or goods.

On the distributive paradigm then, environmental sustainability is the duty of distributive justice regarding the environment between the generations of the earth. Since every generation is equally entitled to the bounty of the natural environment (the thinking goes) every generation should have an equal share of that bounty. But since generations precede each other in time, it is the duty of earlier generations to ensure that later generations receive their fair share. Acting sustainably is the way of meeting this duty, since sustainable practices are those that (ideally) preserve the environment for the future.

Like all theories of distributive justice, environmental sustainability theory has three main components: the community of justice; the principle of just distribution; and what G. A. Cohen³ called the 'currency' of justice, or the stuff that is subject to the demands of just distribution. The first two of these issues have commanded a significant amount of attention from philosophers in the inter-generational case, but it is the last one that concerns me here. The notion of inter-generational *environmental* justice turns crucially upon the selection of a currency. To paraphrase Brian Barry, the central question of sustainability theory is 'What is that thing which justice demands be sustained through time between the generations ?'

There are three schools of thought on the currency of such an inter-generational environmental justice, mirroring the three main approaches to distributive justice between contemporaries: welfare, resources and capabilities/functions,. Welfarists are, by and large, economists (Arrow, Solow, Hartwick, et al), who use consumption, or output, or some other economic metric as a proxy for utility, and then speak of the fair distribution of that proxy between the generations. Resourceists are more likely philosophers (Rawls, Miller, Barry, Howarth, Daley, Pearce, Baxter) who offer some formalized relationship between people and certain sorts of especially important goods making such things the subjects of fair distribution. Capability theorists are also largely philosophers (Sen, Nussbaum, Page, Peters) who pick out the goods to be distributed by reference to their role in supporting and enabling capacities or capabilities of persons.

There is a wealth of argumentation on and around these sorts of theories, and I won't go into those issues here. Rather I want to explore another suggestion for the currency of inter-generational environmental justice, one that has not received sufficient attention in my estimation. This is the proposal by Alan Holland that we use 'nature itself' as the currency of justice. Holland⁴ calls it the 'physical stock' view, and a similar approach is explored by Byron Norton,⁵ who calls it the List of Stuff approach. These views demand that the environment itself be preserved, rather than the *value* of the environment.

Nature itself views have some obvious advantages. For one thing, they are quite 'strong', in the

3 G. A. Cohen, "On the Currency of Egalitarian Justice", *Ethics* (1989) pp. 906-944.

4 Cf. Holland (1999), p. 56.

5 B. Norton, "Ecology and Opportunity: Intergenerational Equity and Sustainable Options" in Dobson (1999), p. 123 ff.

sense meant by sustainability theorists, in other words, they protect the environment directly by demanding that *it* be sustained, rather than its equivalent value. As such these theories are capable of defending the environment even in cases where it has little or no value to people.

But the views have some obvious problems as well. The first is, obviously, their absurd strength. Wilfred Beckerman argues this in the form of a dilemma. On the one horn, it simply won't do to say that we owe the future the *entirety* of the natural world as we know it. For one thing, the natural world is essentially and chaotically dynamic, so any inventory of contemporary nature won't match that of a future state of nature, at least without massive human intervention. For another, it's far too demanding to insist that we preserve every aspect of nature, even in the face a other pressing moral demands, such as feeding and sheltering people. What is needed then is some criterion for deciding when environmental change is allowed, and when it is not. But, on the other horn, this criterion can't just be an appeal to the welfare of people, as that risks a collapse of the view to a capital (or some other value-based) theory:

“For the first main weakness of the Daly critique [of weaker versions of sustainability that employ the value of the environment as the currency] is that he totally fails to indicate the criteria that are relevant in deciding when one is faced with ‘absurdly strong sustainability’ and when one is not – i.e. by what rule does one decide when there may be some trade-off, after all, between some environmental satisfaction and some other form of human satisfaction. For example, he concedes that one might allow some non-renewable resource to be used if the alternative is that some people will starve. The same applies to Jacobs who, at one point, concedes that faced with a choice between preserving some more species of beetles and providing clean drinking water for impoverished people he would usually prefer the latter. But what is the principle involved if not an appeal to some higher value, such as the relative contribution that the options make to human satisfactions?”⁶

So either we owe the future everything – which is entirely too strong, or we owe them those bits of nature which impact their well-being in certain ways, which just is tantamount to owing them the (grounds of) that well-being.

The second sort of problem 'nature itself' views face is one of comparisons across different 'shares' of the world. The natural world is a buzzing, blooming confusion of things, and one that is in constant flux. How then will we be able to determine how one generation's share of the natural environment compares to another? To quote Holland himself on the matter:

“The major question that arises, however, is how far an *aggregation* of natural items is possible, or even makes sense. If all else remains the same, and a couple of lesser spotted woodpeckers go missing, then no doubt we can judge that the stocks of natural capital have been slightly depleted. But consider even so simple an example as that provided by the ‘twelve days of Christmas’. ‘Four colley birds, three French hens, two turtle doves’: what is the total capital here? Well, nine birds, perhaps. But suppose there were three colley birds and four French hens. Would the total be the same? Now throw in nine lords-a-leaping. What is the total here? Eighteen animals perhaps? But what if we now add in the five gold rings? Or an ozone layer, perhaps? One begins to see the difficulties.”⁷

6 W. Beckerman, “How Would you Like your ‘Sustainability’, Sir?

Weak or Strong? A Reply to my Critics”, *Environmental Values* 4 (1995): 169-79, p. 175.

7 Holland (1999) p. 64

I want to offer a suggestion for an approach to 'nature itself' views that I think can handle these difficulties. But my approach turns crucially on a distinction that hasn't, to my knowledge, been made plain in the literature. So let me first take a (rather long, I'm afraid) detour into some more abstract normative affairs.

2. Sharing and Taking Turns

The model of distributive justice has its intuitive purchase in the notion of fair sharing. But there are (at least) two ways in which we might be said to share something between people: by parts and by turns. A pie is shared between children by parts, but a car is shared between siblings by turns. Any principle of just distribution - for example an egalitarian one like 'absent good reasons to the contrary, recipients in the distribution pool should get equal shares' - means different things in the two types of cases.

In a case of sharing-by-parts, like the pie, equal shares means something like each child is owed $1/n$ of the pie, where n is the number of children in the distribution pool. Whereas in a sharing-by-turns case, like the car, equal shares means something like every sibling is owed an equal turn (or set of turns) with the (whole) car.

This distinction is so obvious that merely to call attention to it is to offer sufficient evidence of its reality, but strangely it has been entirely ignored in the vast literature on distributive justice. I think that proper observance of the distinction will be beneficial in a number of areas in this field. But it is in the area of inter-generational justice, and particularly inter-generational environmental justice, where respect for the distinction is most pressingly needed. Let me begin to make this out by first detailing the distinction more thoroughly, with a fairy tale:

Hansel and Gretel

For those who haven't heard this child's story, Hansel and Gretel are a pair of children who, while wandering through the woods, come across a house made of candy. In the original story the house is owned by a witch, who uses it as bait to lure children so as to eat them.

Let us instead imagine that Hansel and Gretel of the fable come across the candy house after the witch is dead and gone, and they decide to share the candy house between them. Now it seems obvious to me that they can share the house in two ways – they can either share it by parts, and divvy up the edible components of the house, or they can share it by turns.

This last can mean a variety of different things. For one thing, they might take serial turns with the house, or they might occupy it together. But however they arrange, it is obvious that if they decide to share the house by turns what would count as a share, and thus perforce what would count as a fair share, will be very different than if they decide to share it by parts.

And this difference is reflected in the duties and debts of justice that the children would

owe each other with regard to the house in the different scenarios. If, for example, they decide to share it by turns and Gretel shows up to find that Hansel has gnawed a hole in the roof, then she has grounds to complain that Hansel has wronged her, has in fact done her an injustice. Whereas had they decided to share it by parts the hole might not have been a problem at all.

Moreover the example shows us many other differences between turn and part sharing. For example, what would count as a fair turn with the house would depend on a number of factors that wouldn't enter into such a calculation for a fair part – factors like the number, order, time and duration of the turns, as well as other factors. It also shows us that the normative relationship between people involved in turn sharing is generally more demanding and more complex than those involved in part sharing. For just one example, it seems obvious that, on any turn-sharing scenario, the children would owe each other the proper maintenance of the house as a duty of justice. I will return to this point later on.

But useful though it is, the example might be a bit misleading in at least the following way: Hansel and Gretel's house is unusual in that it can be consumed directly, in the manner of a pie, as well as lived in; it is both a consumable and a durable good. This might make it seem that the decision to share a thing in parts or by turns is one that is determined entirely by the nature of the the good being shared (e.g. consumables by parts, and durables by turns) and that the candy house is odd in just that it has value in both cases, so that a choice between the two types of sharing is possible.

But this is mistaken. While the consumable/durable nature of the shared good can and should play a role in the choice of a parts or turns-based sharing scheme, the latter is a choice, and not forced by the former. We can share pies by turns, and we can share bicycles by parts. This is because sharing, in this sense, is a *normative* activity. Specifically, sharing in this sense is a matter of apportioning a good with an eye towards satisfying the demands of justice in distribution. What makes a share, and what makes a fair share, are normative matters, matters of justice. In this way, a share is logically distinct from a non-normative division of something, something more properly called a 'part'. The first is deontological, the second merely ontological.

The difficulty here is due in part to the fact that the term 'part', and other mereological terms like 'piece' or 'portion', are often used interchangeably with 'share' (as I did in the example), leading us to assume that the underlying concepts are the same. But as the part/turn distinction shows us, not all shares are parts, since some shares are turns. The brake cables and the handlebars, say, are *parts* of the communal bicycle, but they aren't *shares* of it, not if we're sharing it by turns anyhow.⁸

And this point isn't only made here as a matter of apology for turn-based sharing. Part-

⁸ I'm using the term 'part' here to mean mean some subset of the shared thing, considered timelessly, as this is (I believe) the most common folk notion of the term. We can, of course, conceive of turns as 'temporal parts', or slices of the worm-through-time that describes an object in 4D(imensional) talk. I don't want to take a stance on ontological disputes between 3D and 4D views, but I don't think I have to, since in what follows we see that shares are often things that aren't plausibly parts of the shared object in either sense. Since this is so, there's no need to adopt 4D talk that just obscures the parts/shares distinction.

sharing also takes advantage of the logical distinction between parts and shares. While parts *can* be shares in part-based sharing, they aren't always such. This is because the simple, directly consumable and undifferentiated goods, like pie, for which parts are most directly shares, are only one sort of good we share. And these goods are special in that their component parts are valuable to people in exactly the same way as the total good.

A piece of pie is used in exactly the same way that two pieces, or half the pie, or all of it would be used. But many, many goods are not monotonic in this way, their component parts *aren't* valuable in the same way as the whole, and thus their parts don't make good shares. The bicycle can again serve as an example. The handlebars of the bike, while not completely valueless, are not the same as a proper share of the bike, even if we're sharing it by parts. Rather, we take it that a proper share of the bike is a share of the *value* of the whole bike, measured along some metric of value.

If Hansel and Gretel were to have inherited a regular house, as opposed to finding a candy one, and if they had decided to share it by parts, they very likely wouldn't have dismantled it and distributed the pieces. Rather they would have sold it and shared the wealth. But in such a case, as in the case of the bicycle shared by turns, a share of the house isn't anything like a part of it. A share of it would come in the form of bank notes (or similar), while a part of it would come in the form of some rooms (or lumber, etc).

Let's call this type of value-based part sharing indirect part sharing. We can see that indirect part sharing makes part sharing much more flexible and thus more powerful as a theoretical tool. With indirect part sharing we can share things that can't (or shouldn't) be disassembled into parts. In addition to helping us in cases of complex goods, like bicycles, it also allows us to share actually indivisible things, like intangibles (e.g. the rights to a piece of intellectual property) or organic wholes (e.g. a stud horse), *as if* they were monotonic simple goods, by equating them with a quantity of a monotonic simple good (e.g. money) and sharing *that* instead. Of course, this theoretical power is not without cost – in order to engage in indirect part sharing we need to be able to evaluate the proposed good(s) in terms of money (or whatever value metric we choose), and this is an exercise that is famously fraught with difficulties⁹.

One more thing that I want to note especially about indirect part sharing – it makes it possible to construe turn sharing as part sharing for the purposes of justice. By conceiving of the proper measure of the fairness of a turn in terms of a monotonic value, we can apportion that value in the same way we do when the underlying things to be distributed are parts of the thing itself, rather than a turn with it.

This technique is especially useful for cases where the underlying good produces some additional value over time. So (to mix our fables) if Hansel and Gretel had come across a goose that laid golden eggs, they could indirectly share it by parts (obviously direct part-sharing would be a no-no in this instance) by simply agreeing that the proper value of a 'turn' was x number of eggs, and distributing money accordingly. And this despite the fact that the goose

⁹ See, e.g., Holland (1999), p. 57-62 for a useful summary of these difficulties in this arena.

itself could only really be shared by turns between them.

In closing, let me rehearse the three important claims I want to export from this long discursis:

1. There is a distinction at the normative level between sharing something by parts and sharing it by turns. The distinction is relevant to judgements of what constitutes a share of some good, for the purposes of justice, as well as what constitutes a fair share, and it plays a role in other judgements of what duties of justice are owed.
2. The distinction between part and turn sharing is independent of the actual nature of the goods being divided, and goods that are naturally 'shared' (i.e. apportioned between people) by one method can be shared by the other. This is the result of the logical independence of the concepts of 'shares' as portions in a distribution of a good, and 'parts' as components or pieces of a larger whole.
3. This logical independence in particular allows for 'indirect' part sharing, where the shares aren't actual parts of the good shared, but rather fractions of some quantity of a monotonic value metric like money that is meant to represent the good. And this freedom allows us to conceive of indivisible (and other turn-shared) goods as being shared by parts.

With these three before us, let me try and make out two further claims. Firstly, that the distribution problem between generations of people has been conceived (tacitly) as one of indirect part sharing, and secondly that we would be better off moving to a turn sharing model if we wish to adopt a 'nature itself' currency of inter-generational environmental justice.

3. Sharing the Earth, by Parts and by Turns

That welfarists, resourcists and capability theorists alike conceive of the inter-generational sharing of the natural environment as one of indirect part sharing is plain by the sorts of conceptual apparatus they employ. For example, all of them require that 'nature' be measured in some further, commensurate currency (welfare, capital, etc) and thus all have the same sorts of difficulties with 'measurement', i.e. with the valuation of the various parts of the natural world for the purposes of inter-share comparison.

As to the second claim, let me begin here by returning to the two problems I outlined above for these views. I will try to show that the problems are the products of retaining a parts-based approach to sharing the earth, even as one moves from indirect sharing to direct, i.e. from a distribution of capital (or whatever) as a proxy for nature to a distribution of nature itself. Then in support of the second claim I will try and show how a turn-based approach would avoid the difficulties. After that I will close with a quick fleshing out of the turn-based approach.

Let's start with the problem of the 'absurd' strength of such views. Why does Beckerman, like Daly¹⁰ before him, think that these views are too strong? Because, I submit, he (tacitly) understands the 'natural environment' as a collection of parts. And if we owe each other 'nature itself', then we must owe each other the parts. And if we owe each other the parts, we must owe each other *all* of the parts, unless there's some good reason why some of the parts aren't included in the deal. It is this tacit assumption of parts-as-shares that makes the idea that we owe the future 'nature itself' into the first horn of the dilemma.

But if we take a turn-based approach to distributing the environment, there's no problem with owing the future 'all of nature', any more than the fact that Hansel owes Gretel a turn with the whole house is a worry for him. That's because Hansel isn't conceiving of Gretel's share as a collection of (all of) the parts of the house, but rather as a turn with the house. And, unlike in cases of part-sharing, turn sharing doesn't require mereological accounting, the totting up of the various parts. If Hansel were delivering Gretel her part-share of the house then he would have to worry about all the various bits and their fair division, either directly in the cutting up, or indirectly in the valuing and dividing of the money, but not so if he merely owes her a turn.

This is not to say that there wouldn't be any demands on Hansel to provide a fair turn. As we saw earlier, he couldn't gnaw a hole in the roof. But he's forbidden from such not on the grounds that Gretel is owed (half of) that bit of candy, but rather on grounds of the minimum standards of acceptability of the *shape* or condition the house for her turn. From this we should also be able to see that Hansel has licence to make whatever changes he will to the house that don't violate the standards of maintenance, including those that would alter the value of the house or of its components. Hansel can, for example, cut the grass without worrying about Gretel's share of the lawn clippings, on the perfectly plausible assumption that such would not be part of what constitutes a 'fair turn' with the house.

What will determine whether a change is allowed is a matter of what is deemed necessary for a fair turn, and this standard is a complex one. As I will detail somewhat below, this standard is sensitive to a variety of circumstances and interests. Here I just want to stress the negative claim that the problem of the need to preserve absolutely everything doesn't plague the turn based approach.

So in summary, a turn based approach takes the sting out of the first horn of Beckerman's dilemma, by making it reasonable to claim that we owe the future 'all of nature', since what we owe them is a (fair) turn with nature, rather than all of the parts of it.

And our answer to this problem contains in it the seeds of the answer to the second one – that of comparisons of 'nature' across generations. Again, the difficulty here is largely a matter of conceiving of nature as something to be shared by parts. This is because many principles of just distribution require that part-shares be compared with one another along some quantitative dimension. Chiefly, arithmetic sorts of distributive principles, like equality, will need to compare part-shares to each other in some simple quantitative way to determine whether the

10 Cf. Daly & Cobb, *For the Common Good*, London:Greenprint (1989)

principle is upheld. And since the standard distributive principle employed among and across theorists is equality, inter-share comparison is a live issue.

But as our previous answer showed, this sort of simple inter-share comparison isn't necessary for judgements of fair turn sharing, at least not comparisons between the parts of the thing shared. Turns might have to be compared along the dimensions mentioned earlier: number, duration, time and order (although, as we can see in the inter-generational case, this isn't necessary if the number, duration, time and order of the turns are decided by fate) but we don't have to compare parts of a thing to share it by turns.

As we saw above, what Hansel owes Gretel in terms of maintenance of the house typically won't make any reference to the market value of the house or the utility of its component parts. Rather it will be spelled out in terms of the livability (and other desiderata) of the house itself, and generally framed in threshold terms, e.g.: "The house must be at least thus-and-such, or have at least this many so-an-so." And it is just these sort of 'threshold on an absolute scale of measurement' standards that a turn based approach can employ to understand the demands of justice as regards the environment

The case I've made for the turn based approach has so far been largely negative. I've tried to show above that the approach isn't vulnerable to the sorts of problems that affect a parts based approach to sharing 'nature' or the earth itself between the generations. Perhaps now it's time to try and flesh out the approach a little, and get a glimpse of what an operationalized version of turn sharing might look like.

As I said, turn fairness is a complex matter, much more involved, normatively speaking, than part fairness, which is relatively simple and quantitative by comparison. In the case of serial turns, the number, time, duration and order of the turns will be relevant to the fairness of a distribution, whereas simultaneous turns will have other factors, such as accommodation and interference. Of course, in the inter-generational case these issues are moot, as I noted above. Still, the inter-generational case will share standards of maintenance of the shared good with all other cases of turn sharing (at least all cases with a good that needs maintenance). So the central issue for an operationalized theory then is the nature and extent of these maintenance demands.

How do we go about formulating maintenance demands for a shared thing? Looking back at the Hansel and Gretel example, one thing we can say is that the function or purpose of the thing plays a role in determining the standards. Hansel isn't allowed to eat through the roof, but he is allowed to cut the grass, prior to Gretel's turn. Why? Because the former interferes with the proper function of the house, while the latter doesn't, it would seem.

But the functional story isn't the whole picture. Sometimes what's salient about the thing we share isn't so much its function, but rather that it is capable of flourishing. If, for example, Hansel and Gretel were sharing a beautiful rose bush by turns, then the standards of maintenance for a fair turn wouldn't be determined by the function of the bush, but rather by the (botanical) standards of flourishing.

Perhaps these two sorts of standards form the poles of a spectrum of possible metrics of turn fairness, from functionalist to flourishing. Then the question we need to answer to begin operationalizing the view is: where on the spectrum do we put 'nature'?

Of course here we're confronted by the fact that 'nature', undifferentiated like that, is a massive and multivaried thing. It isn't so much one thing, or even one sort of thing. Rather, it's many things and many types of things. As a result, whatever standards of turn fairness we end up with will likely be fairly complex and varied themselves. Still, even at this mile-high level of abstraction, I think we can say something interesting about this issue.

If we approach nature as a functional entity, and describe it in terms of the goods and services it provides us, then the natural sort of metrics for turn fairness will be described in those terms. So, for example, a functionalist might demand that the earth be left in such a condition that the soil continue to be able to produce sufficient organic vegetable matter, since such production is a vital service of a properly functioning earth. If we take the earth as a flourishing thing, however, then the standards of maintenance will invoke indices of environmental 'flourishing', however we spell that out. One obvious way would be to define flourishing in terms of ecological 'health', in one way or another.

I don't have a worked out view to offer here, but I must say that my sympathies are with the flourishing picture over the functionalist one. This is not to say that there shouldn't be functionalist elements in the final set of standards, as I said, the nature is big and complex enough that we will certainly need both sorts of metrics in our standards. Rather I just think that 'health' should be the guiding principle of fairness here, that we owe the future a turn with a suitably 'healthy' environment.

I want to close by briefly noting some other positives we get from adopting a turn based approach to inter-generational environmental distribution. Firstly, if turn sharing allows us to get past Beckerman's dilemma and the other problems, and so to adopt the 'nature itself' currency, then we reap the benefits of that currency. Not the least of which is the ability to bridge the gap between the ecological discourse on sustainability, which speaks almost exclusively in terms of nature itself, and the normative (philosophical, political, policy) discourses, which rarely do.

Secondly, as Holland and others have noted, other theories of sustainability can't protect nature at all when what is in human interests collides with what is in nature's interests. What is needed is a theory that uncouples (to some degree) human welfare from natural welfare, and protects the latter at the expense of the former, at least in some cases. But a turn based system can deliver such a thing, and without even the need to invoke an independent moral value in nature itself.

This is because direct sharing, i.e. sharing of actual things, rather than their value-proxies, can mean that a share is owed even if that share isn't in the best interest of the recipient. If Hansel and Gretel have a fast car to share, and Hansel is very likely to drive it too

fast, with all the badness to him that entails (ignoring for now the complication of badness to others for the moment), that fact doesn't mitigate at all the fact that he is indeed owed a turn. So if future generations are owed a fair turn with nature, then even if we could give them more welfare by shortchanging them on nature, the duty of justice might forbid it.

References

- Ayres, Robert U., Bergh, Jeroen C.J.M. van den and Gowdy, John, (1998), "Viewpoint: Weak versus Strong Sustainability", No 98-103/3, Tinbergen Institute Discussion Papers, Tinbergen Institute.
- B. Barry, "Sustainability and Intergenerational Justice" in Dobson (1999)
- W. Beckerman, "How Would you Like your 'Sustainability', Sir? Weak or Strong? A Reply to my Critics", *Environmental Values* 4 (1995): 169-79
- G. A. Cohen, "On the Currency of Egalitarian Justice", *Ethics* (1989) pp. 906-944
- H. Daly and J. Cobb, *For the Common Good*. London: Greenprint (1989)
- H. Daly, "On Wilfred Beckerman's Critique of Sustainable Development", *Environmental Values* 4 (1995): 49-55
- P. Devine and D. Rigby, "Operationalizing Strong Sustainability", *Environmental Values* 13 (2004), pp. 279-303- H. Daly & J. Cobb, *For the Common Good*, London:Greenprint (1989)
- A. Dobson, *Justice and the Environment*, Oxford (1998)
- , *Fairness and Futurity*, Oxford (1999)

- F. Figge, "Capital Substitutability and Weak Sustainability Revisited: The Conditions for Capital Substitution in the Presence of Risk", *Environmental Values* 14 (2005): 185-201
- A. Holland, "Sustainable Development: Should we Start from Here?" in Dobson (1999)
- D. Pearce, A. Markandya and E. Barbier, *Blueprint for a Green Economy*. London: Earthscan (1989)
- B. Norton, "Ecology and Opportunity: Intergenerational Equity and Sustainable Options" in Dobson (1999)
- J. Pezzey, (1989) *Economic Analysis of Sustainable Growth and Sustainable Development*. Environmental Department Working paper no. 15, Environmental Department, The World Bank. Reprinted as J. Pezzey, (1992) *Sustainable Development Concepts: An Economic Analysis*. World Bank Environment Paper 2
- J. Rawls, *A theory of Justice*, Harvard: Cambridge, (1971). See pp. 284-293
 - R. M. Solow, "Intergenerational Equity and Exhaustible Resources", *The Review of Economic Studies* 41, (1974), pp. 29-45