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How Would you Like your 'Sustainability', Sir? Weak or Strong? A Reply to my Critics

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ABSTRACT: This article concentrates on the Jacobs and Daly criticisms (*Environmental Values*, Spring 1994) of my earlier article in the same journal (Autumn 1994) criticising the concept of 'sustainable development'. Daly and Jacobs agreed with my criticisms of 'weak' sustainability, but defended 'strong' sustainability on the grounds that natural and manmade capital were 'complements' in the productive process and that economists are wrong, therefore, in assuming that they are infinitely substitutable. This article maintains that they are confusing different concepts of 'complementarity' and 'substitutability'. It is also argued that, in fact, they do both sell crucial passes in their defence of strong sustainability without providing any clear criteria for their abandonment of it in certain cases. It is also denied that the fact that environmental services may provide different satisfactions from those obtained from other goods and services elevates it to the status of some over-riding moral value, or that discounting future costs and benefits is 'unfair' to future generations.

KEYWORDS: Discounting, economic welfare, environmental values, inter-generational justice, natural capital, scarce resources, sustainability.

INTRODUCTION

Of the three criticisms of my earlier article on this subject (*Environmental Values*, Autumn, 1994) that appeared in the Spring 1995 issue of this journal, the one by Professor Skolimowski can be passed over very quickly. For at no point does he actually address himself to any of my arguments. He limits himself to vague generalisations about the superiority of what he calls the 'new economic thinking' over the 'old economic thinking'.

For example, he attacks the old economic thinking's 'crass allegiance to the materialist world view' and its pretence to be 'value neutral'. Perhaps Professor Skolimowski forgets that the father of modern economics, Adam Smith, was a moral philosopher whose first great work was *The Theory of Moral Sentiments*. Indeed, the economist's concern with the value judgements at the heart of normative economics has persisted to this day. Pigou's classic *The Economics*

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of Welfare (1920), for example, emphasises that economic welfare is not the whole of welfare and that improvements in it can sometimes conflict with non-economic components of welfare. Modern landmarks in the theory of welfare economics, such as Graaff's (1957) or Little's (1950), go to great trouble to emphasise the value judgements at the heart of welfare economics, as do most other works on the subject. It is too much to expect Skolimowski to have bothered with my own modest contributions to the subject, but in my 1974 book I devoted a lot of space to explaining why there is nothing inherently 'materialist' about the economist's approach to problems of economic growth and the environment.²

The only specific reference to my article on sustainability is to my suggestion that the concept did not appear to be operational. Skolimowski's reply is 'Who on earth would want to operationalise the concept of Sustainable Development?' (p.69). The answer is, I suppose, all of us who would like to use concepts for purposes of designing policy rather than just for demonstrating the nobility of our sentiments. Daly, in fact, does suggest (p.50) rules for operationalising the concept and refers to similar contributions made by others.

I shall concentrate in this article on the contributions by Michael Jacobs and Herman Daly. Here my task is made easier by the fact that they both agree with the main part of my article, namely that the concept of 'weak sustainability' does not make sense. After summarising part of my case against weak sustainability, Jacobs says that 'Beckerman's criticisms of it are absolutely correct' (p.60). But he goes on to maintain that I have won a hollow victory since '... very few people who would call themselves "environmentalists" believe in weak sustainability'. As evidence of this he states that at the 1994 conference of the International Society for Ecological Economics 'weak sustainability was hardly mentioned' (p.60). But Daly takes a very different view and writes that 'I must congratulate him [i.e. me] for his effective demolition of "weak sustainability"'. I hope he has more success than I have had in converting the many environmental economists who still cling to it' (p.49).

Jacobs goes on to list some of what he calls '...some of the subject's most distinguished theorists and practitioners' as being advocates of strong sustainability. Now I cannot say that I diligently study all the works of the 'distinguished' people that he mentions. But among the list is Richard Norgaard, who, either alone or in conjunction with Richard Howarth, has published so many papers on the subject that it would have been difficult for me not to have stumbled on some of them. One recent paper by him and Howarth describes certain possible development options as being unsustainable '...since future generations are left worse-off than the current generation' (1992, p.474). This is not strong sustainability by any stretch of the definition. (Their criterion of sustainability – that future generations should not be worse off than present generations – is also, incidentally, a strange definition anyway, since, taken by itself, such an outcome could still leave future generations better off than they would be under some other path of development.)

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But I shall leave Jacobs and Daly to argue between themselves how many corpses are left on the ‘weak sustainability’ battlefield on which I have, apparently, won a victory – hollow or not. Most of my article had been devoted to this battle because I had assumed that weak sustainability was the more plausible variety of the sustainable development concept, whereas strong sustainability was so obviously absurd that nobody serious could possibly support it, and so was hardly worth spending time on it. The errors in the former concept seemed to me to be less obvious than the objections to the latter and hence required more careful analysis. If Daly and Jacobs are representative, however, of a significant strand of environmentalist thinking, then clearly I must now concentrate on the strong sustainability concept. Before doing so, however, I should take up one or two other points raised by Jacobs, though briefly touched on also by Daly. These are the concept of optimality and the plurality of values, and the question of discounting and fairness towards future generations. Brief sections on these, therefore, will precede a more detailed discussion of strong sustainability.

OPTIMALITY AND THE PLURALITY OF VALUES

One of Jacobs’ points is that strong sustainability can be defended on two quite different grounds. The first is that natural capital is an irreplaceable input into the productive process – what Daly calls the complementarity of natural and man-made capital. This, as he rightly says, is the main thrust of the Daly critique, to which I shall return later. The second is that the environment has some independent value for ‘consumption’. ‘In this case’, he argues, ‘the source of strong sustainability is an ethical and/or empirical belief in what we might call *welfare pluralism*. By this is meant the belief that human beings need a variety of different *kinds* of goods, services, experiences and relationships in order to achieve wellbeing... This goes against orthodox economic thinking. Welfare economics generally assumes that welfare is a single value in which all goods can be measured.’

I am not quite sure what Jacobs has in mind here, and I am reluctant to trust Jacobs as an authority on ‘orthodox economic thinking’.³ But I do think that he has touched – perhaps unintentionally – on an interesting problem concerning the nature of welfare economics. I think I am right in saying that orthodox economics does not claim that all goods and services provide the same sort of satisfactions. I do not believe that any economist in his senses would claim that one obtains exactly the same sort of satisfaction out of eating food, listening to music, enjoying the company of friends or family, admiring the scenery, reading books, or any other of the thousands of activities that people enjoy and which they will hence pursue for prudential motives. In fact, there is an important school of demand theory, stemming from pioneer work by Kevin Lancaster, that

analyses goods and services in terms of their different characteristics and types of satisfaction that they provide.⁴

Furthermore, the claim that all goods and services provide the same sort of satisfaction is not even necessary for the purposes of conventional economic theory. As long as people can rank the different degrees of satisfaction that they derive from different quantities of different goods and services available to them they will be prepared to exchange them at different rates. As the philosopher James Griffin argues, we can all agree that there is no ‘...single mental state running through all the things that we rank in terms of which we rank them’ but that this ‘...does not mean that there is no single scale for ranking prudential values’ (i.e. those things that make a person’s own life valuable to him).⁵

Nevertheless, it is true that economists have found it convenient to describe a consumer’s preference for one bundle of goods over another as representing the maximisation of a ‘utility’ function, or to describe a preference by society for one state of nature (defined in terms of a distribution of individuals’ utilities) as representing the maximisation of a social ‘welfare’ function. This terminology has greatly helped the elucidation of many theorems in the analysis of consumer behaviour or in ‘welfare’ economics, particularly when mathematical analysis has been important or crucial. But that does not imply that ‘welfare’ is really seen as some homogeneous form of intrinsic end-good to which everything else (e.g. peoples’ utilities) is a purely instrumental input. Even when ‘utility’ is explicitly equated with ‘desiredness’, as it was for many earlier writers, this did not imply that goods encompassed in welfare economics were desired on account of their being the source of the same kind of satisfaction.

Jacobs’ second error is to believe that because the environment provides a different and special kind of satisfaction, like most things that people value, it has some independent moral value and constitutes an example of moral pluralism. But the fact that people derive satisfactions of different kinds from different goods and services and personal relationships has nothing to do with the plurality of moral values. Does enjoying a good meal have a moral value because the type of satisfaction that one derives from it is not the same as that which one derives from admiring a Fra Angelico fresco? Indeed, the fact that one can derive direct consumption value from the environment – e.g. from admiring the scenery or the wildlife – can hardly be claimed to be a reason why its pursuit is a moral obligation. If moral values were also invariably prudential, life would be much easier. As it happens, most moral values are probably not only incommensurable with each other, but also lie outside the domain of prudential values and often conflict with them. For example, one may frequently be faced with a conflict between some prudential value – be it some good or service or some valued personal relationship – and some moral value, such as justice, or honesty, or mercy.

Now it may well be that strong sustainability can be defended in terms of some independent moral value. For example, it might be argued – and I believe it often is argued – that we must not damage the environment on account of the

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rights of animals or even some 'intrinsic' value in non-sentient forms of natural capital. But that argument has to be made. Jacobs does not even attempt to make it, and Daly does not mention it. So, as far as Jacobs/Daly are concerned, therefore, the defence of sustainability reduces to the defence of 'strong sustainability' on the basis of the 'complementarity' argument, to which I shall turn shortly.

DISCOUNTING AND FAIRNESS TO FUTURE GENERATIONS

In my article I argued that the discount rate should be used to select between alternative investments, environmental or otherwise, in the interests of maximising the economic 'welfare' of society over whatever time period (and hence number of generations) was considered relevant. I maintained that this was the means by which the interests of future generations would be protected and that the claims of 'sustainability' did not detract from this proposition. Daly and Jacobs criticise this argument for totally different reasons.

Jacobs falls back, once again, on the alleged uniqueness of the environment as compared with other sources of welfare. But the logic of his argument is difficult to follow. He claims that discounting is no good because 'natural and human-made capital are not infinitely substitutable'. Well, so what? Nobody suggested that they were. Hardly any ordinary goods and services are infinitely substitutable for each other either, but this does not prevent people trading them off against each other, or calculating how much it is worth investing in one rather than the other. Even John Rawls, who shares – like most economists – the widespread condemnation of 'pure' time preference, agrees that the interest rate should be used to ration limited funds for investment.⁶

Daly criticises the discounting procedure on the grounds that the discount rate used is a price like any other price and, like any other price, its relative level is determined by, *inter alia*, the distribution of resources among people. Since future generations are not represented in the market in which the discount rate is fixed, we cannot assume that it is the one that would fairly reflect what their particular preferences would be. That is true. But nor do we have any reason to believe that they would prefer a higher or lower discount rate or that we should make different assumptions concerning the future relative price of environmental services. I am not at all sure that I believe that my grandparents or parents should have made even greater sacrifices of their consumption levels in order to bequeath more to their descendents, which is what a lower discount rate would have implied. What discount rate should be used for social investments is, of course, a difficult question that has been much studied in the economics literature.

What discount rate 'fairly' represents the interests of future generations depends partly on what one means by being 'fair' to future generations. This is an issue to which philosophers have only recently given much attention.⁷ The

well-known Rawlsian theory of justice does not, in fact, provide any consistent and clear guidance on this matter, contrary to the claims often made by some environmentalists. Indeed, Rawls himself denies that he can present any clear solution to the problem.⁸ At the same time, as Brian Barry argues, it is in his treatment of inter-generational justice that Rawls is closest to his main insight, namely of justice as 'fairness', and this does, perhaps, provide one way of getting to grips with the problem of discounting.⁹

For one simple refutation of the claim that discounting is 'unfair' to future generations, is, I think, one that I have presented elsewhere.¹⁰ This is to suppose that a sudden leap in medical science meant that we all expected to live for at least another two hundred years. We would still be well advised to use the discount rate to ration scarce investment resources, since this is the way we would maximise the flow of goods and services that we would expect to enjoy over our lifetimes.¹¹ In fact, of course, we shall not live for two hundred years and it will be different people who will experience the consequence of our discounting procedure. But they cannot complain that we have been 'unfair' to them since we would have experienced the same consequences if it had been us that had been alive in two hundred years' time, instead of them. We are treating them in exactly the same way as we would have treated ourselves had we expected to be in their place in two hundred years' time. This surely satisfies Kantian tests of impartiality and hence of Rawlsian fairness. In the event that the discounting practice was not in their interests it would not have been in our interests either. So we cannot be treating them 'unfairly' for selfish motives.

THE 'COMPLEMENTARITY' ARGUMENT

The bulk of Daly's critique, to which Jacobs subscribes, is that 'Strong sustainability assumes that manmade and natural capital are basically complements. Beckerman completely missed that one. He thinks that strong sustainability means that no species could ever go extinct, nor any non-renewable resource should ever be taken from the ground, no matter how many people are starving. I have referred to that concept as "absurdly strong sustainability" in order to dismiss it' (p.49). Like Jacobs, he attacks the assumption (not made by me or any economist that I know of) of infinite substitutability between manmade and natural capital.

So now we have three concepts of sustainability, weak, strong and 'absurdly strong'. At the 1994 conference of the International Society for Ecological Economics, to which Jacobs referred, the conversation at the coffee-breaks presumably went as follows:

'And how would you like your sustainability, Sir? Weak or strong?'

'Oh, strong please, but not absurdly strong'

'And how about you Sir? Weak or strong?'

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‘Er, I’ll take mine weak please, but not pathetically weak’
 ‘How many drops of substitutability would you like in it, one or two?’
 ‘Ah, that all depends’
 ‘Depends on what Sir?’
 ‘Oh, I’m afraid I haven’t worked that out yet’

For the first main weakness of the Daly critique 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? Democratic societies should be very wary of those who claim, without full explanation, that the activities that they happen to prefer should be elevated to the status of some over-riding moral value to which individuals should willingly sacrifice themselves.

Jacobs complains of the need for economists to show more humility. But it is our insistence on the weight that must be given to individual preference that is the hallmark of our humility. It is true that strong – and very debatable – value judgements are concealed in the usual welfare economist’s respect for consumer sovereignty. But the concept of ‘merit’ goods shows that economists do recognise some limitations on the extent to which society is under moral obligation to respect preferences, and the literature of welfare economics is also full of discussions of these and other value judgements. Nevertheless, the economist’s respect for preferences – even circumscribed – contrasts favourably with the views of hard ecologists and the fans of strong sustainability who display a messianic certainty that they know what is good for people and that they occupy the moral high ground so that detailed logical argument is unnecessary.

Daly’s second main error is more technical and runs through almost the whole of his article. This is that he completely confuses different concepts of substitutability and complementarity. To begin with he mixes up the relationship of substitutability (or complementarity) between goods or factors of production as defined *for given levels of utility or output* with the relationship between them when the level of utility or output is allowed to vary.

In the theory of consumer’s demand a distinction is made in the definition of ‘substitutes’ and ‘complements’ according to whether or not one is holding constant the overall level of utility. For example, apples and pears are clearly substitutes in the normal technical economist’s sense of the term, because a fall in the relative price of apples would lead to a rise in the proportion of apples to

pears in an individual's consumption pattern. But the fall in the price of apples could make the consumer richer so that although he will still switch from pears to apples this 'income effect' of the fall in the price of apples could lead to him buying more of both and finish up actually buying more pears than before. In that case, the relationship of pears to apples would be one of *gross* complementarity. In the case of two goods this outcome could only occur on account of the income effect and a change in the total level of utility.

The same applies to factors of production, such as labour and raw materials. In the normal case they will always be substitutes, *for a given level of output*, given conventional economic terminology. But a fall, say, in the price of labour could so reduce overall costs of production that the profit-maximising level of output might rise with a corresponding rise in inputs of raw materials as well as labour. In that case, the raw materials would be *gross complements* for labour.

The first point to notice about this framework is that whereas, in the normal case, goods (whether consumption goods or factors of production) are always substitutes (having zero substitutability in the limiting case – like left and right-hand gloves) *for a given level of utility or output*, they can also be *gross complements*. For a given level of utility or output the two classes – substitutes or complements – are mutually exclusive, but the classes 'substitutes' and 'gross complements' are not.

But not only does Daly fail to specify which concept of complementarity he is talking about, he even mixes it all up with situations in which the scale of output increase for exogenous reasons (i.e. not induced by a fall in the price of one of the inputs). Thus, in a context in which the scale of output is allowed to change exogenously, the inputs can be simultaneously both substitutes in the conventional technical economic sense (a change in their relative price could set up change in the opposite direction in their relative use) and complements in Daly's sense (a rise in the scale of output could require increases in all factors of production). As a matter of logic, therefore, the fact that manmade and natural capital may be what Daly calls 'complements' as the scale of world output rises does not mean that they are not also 'substitutes' in the usual technical sense of the term in economics. The two possibilities are obviously not mutually exclusive in such a context.

But, worse still, Daly even confuses the issue more by mixing up the concepts of substitutability and complementarity with the relationship that exists between outputs and the inputs that are used to produce them! Thus, for example, since natural capital – e.g. iron ore, fossil fuels and so on – has to be used in the course of producing manmade capital, Daly also defines this as a relationship of 'complementarity'. But this has nothing to do with the economist's concept of this name. And if complementarity is defined so that it encompasses the use of an input to produce some other good, then it is trivially obvious that there are unlimited possibilities for an input to be both a complement and a substitute for another input. The fact that labour, for example, is 'complementary' to machin-

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ery – under Daly’s definition – because it is an input into the production of machinery, does not mean that labour and machinery are not substitutes for each other in producing something else. Greater confusion could hardly be imagined.

As a result of mixing up the various concepts of substitutability and complementarity and inventing one of his own, Daly is led into absurd logical errors. For example, he maintains that the proof of the complementarity of natural and manmade capital (in his sense) is his demonstration that they could not be ‘near perfect substitutes’ for each other (which he says, wrongly, is claimed by economists). And, he goes on to argue, if they had been near perfect substitutes ‘...there would have been no reason to accumulate manmade capital in the first place, since we humans were already endowed by nature with a near perfect substitute. But historically we did accumulate manmade capital – precisely because it is complementary to natural capital’ (p.51). But, as I have shown above, manmade and natural capital can be close substitutes in many uses in the usual economist’s sense of the term and still be complements in Daly’s private language, a fact that no economist would dispute.

Of course, treating natural and manmade capital in aggregative terms is not very helpful. In practice the question will be how much it costs, for example, to produce synthetic rubber rather than use the natural product from plantations. In this case both products are very close substitutes. But this does not preclude the possibility that it is sometimes worthwhile producing both. Much depends on changes in technology and other factors determining the relative rate of return on the exploitation of natural capital and of manmade capital. As the relative price of synthetic rubber fell and technological progress improved its characteristics so more of it was used. Indeed, Daly’s triumphant observation that ‘But historically we did accumulate manmade capital....’ is as much evidence for their substitutability for each other as for their complementarity.

Daly also fails to take account of the implications of technical progress, particularly when we are concerned with production – as distinct from consumption. For example, labour on a farm is needed to work the machinery. Labour and capital will be substitutes, in the normal case (even though beyond a certain point increased use of machinery, for example, would not lead to any increase in output). It is even possible that a fall in the price of labour, say, would raise the profitable level of output to the point where the demand for machinery would also rise. The two factors of production would then be *gross* complements. But this has not prevented technical innovation from leading to the continual substitution, over time, of machinery for labour down on the farm.

So the real issue is how far output is likely to be constrained in the foreseeable future by shortages of some input into the chain of production. How far will increases in the scale of output, with its attendant rise in the demand for all factors of production, be met by technological innovation and changes in the relative prices of manmade and natural capital? Both of these processes can lead to substitution of manmade for natural capital, in spite of the fact that *if relative*

prices remain constant and there is no technical progress more of both are needed if output is to expand.

These are empirical issues, and I have set out at length, many years ago, the reasons for believing that the notion of resource constraints on output is quite unfounded.¹² And I have updated the evidence in another book published this year.¹³ The main point is that insofar as any natural resource does become scarce in a relevant sense its relative price will rise and this will set up a chain of market responses which will tend to discourage its use and encourage the development of substitutes. Sudden disappearance of a natural resource does not happen overnight outside the realms of science fiction. Society adapts all the time to changes in demand and supply. Even if, in spite of an astronomic rise in its price, some resource did finally run out, by that time society will have learned to live with almost no consumption of it. In the end Daly falls back on the Georgescu-Roegen fears of the implications of ‘entropy’ and of the second law of thermodynamics and associated pseudo-scientific attempts to blind the innocent with science, when all it means is that when you have burnt some coal you don’t have it any more. But long before the world runs out of coal supplies (if ever) coal will have become so expensive that it would be used for jewellery, rather than for fuel.

NOTES

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² Beckerman (1974), chapter 4.

³ For example, he writes at one point that economic growth ‘...provides a broad measure of the rate of return which one could get if (instead of consuming) society invested its money in the stock market’ (p. 59). But it is investment in real assets, including human capital, that promotes economic growth; not investment in any form of financial asset. These merely indicate ownership of society’s productive capital. Elsewhere he states that ‘Economic growth may make future people better off in *financial* terms’ (p. 59). This, too, is very misleading. Economic growth can only make society as a whole better off in ‘real’ terms – it provides future people with a greater flow of goods and services of all kinds. How the shares in this flow are distributed among individuals will depend partly on their financial assets. But one person’s financial asset – unit trusts, shares, bonds or cash – is another person’s liability. Society as a whole cannot be better or worse off in financial terms.

⁴ Kevin Lancaster (1971).

⁵ James Griffin (1986), p.89.

⁶ John Rawls (1972), p.295.

⁷ See a survey of some philosophical difficulties surrounding the problem of our obligations to future generations in Joanna Pasek (1992).

⁸ John Rawls (1972), pp.284 and 286.

⁹ Brian Barry (1989), p.200.

¹⁰ See Wilfred Beckerman (1995), chapter 11.

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¹¹ Of course, there would be many indirect effects of such a change in life expectancy, including for example the number of heirs that we might expect to have, or the lifetime profile of our working/retirement arrangements, and so on, so that there would inevitably be some effect on the market rate of interest.

¹² Wilfred Beckerman (1974) chapter 8, 'Resources for Growth'.

¹³ Beckerman (1995), chapter 4.

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