Comments on Pirgmaier vs Daly: What is steady-state economics?

Abstract:

Elke Pirgmaier has claimed ('The neoclassical Trojan horse of steady-state economics', *Ecological Economics* 133: 52-61) that both the work of Herman Daly and steady-state economics (SSE) – which she uses interchangeably and imprecisely – is a version of neo-classical economics. This claim is as surprising as it is false. Daly and steady-state economics are moreover, as represented by Pirgmaier, shallow, contradictory and dangerous for ecological economics. However, Pirgmaier misunderstands the fundamentals of both Daly's thought and steady-state economics, specifically that their defining, new and ecologically relevant pillars are 1) a sustainable scale of throughput and 2) a just distribution of natural resources. 'Throughput' is the total of 'good' natural inputs into, and 'bad' output returned to, nature, resulting from human production and consumption activities, the respective problems being those of depletion and pollution. Contrary to Pirgmaier's take, a minor and logically separate role is given in both Daly's thought and SSE to the allocation of resources to specific goods and services. Due to this and other misunderstandings, presented moreover in an associative rather than logical style of argument, Pirgmaier's case fails.

1. Introduction

The title of Elke Pirgmaier's (2017) criticism of Herman Daly and steady-state economics (SSE) is 'The Neoclassical Trojan Horse of Steady-State Economics'. The title breaks down into the claims that 1) "the vision of a steady-state economy elaborated by Herman Daly" is neoclassical, and that 2) it is a Trojan horse brought into "ecological economics as a field more generally". (p 52)[1] But SSE is not a version of 'neoclassical economics' (NCE), as Pirgmaier claims, and Daly's use of certain concepts also used by 'neoclassical economics' cannot defeat or even damage ecological economics, as the Greeks defeated Troy by means of their wooden horse. Since Pirgmaier does not rigorously define ecological economics, the difference between it and SSE is not clear, but she does – correctly – define SSE as a "hierarchy of three consecutive goals: sustainable scale, just distribution, and efficient allocation" (pp 52, 56).

Pirgmaier claims that she

> deconstructs [the] foundations of steady-state theory… by highlighting that steady-state economics relies on the neoclassical theory of demand, supply, and general equilibrium

[1] All citations of Pirgmaier are *2017*.

> theory, which leads to theoretical inconsistencies, contradictions and unresolved issues. (p 53)

While no clear definition of NCE emerges, one can piece together her descriptions in order to adduce a rough definition. They seem to be a set of beliefs about "allocative efficiency", "perfect markets", "initial endowments", "willingness to spend", "the existence of markets for all goods and services", and "'the invisible hand' of the market" which together yield "optimal societal outcomes" (even in the environmental realm). (pp 53-54) That most of this set of beliefs is better subsumed under classical rather than neoclassical economics, moreover, means that Pirgmaier owes the reader an explanation of the distinction between classical and neoclassical economics – but this remains unclear. At any rate, NCE also involves "trajectories and policies prioritising GDP growth", "standard market theory", "rational economic man", etc. (p 59) If this sounds like the opposite of either SSE or the work of Herman Daly, that is because it is.

To the large extent that Pirgmaier's article is argued associatively, one must read it as rhetoric or even polemics rather than as logical interpretation. My method will be to use specific quotations from both her and Daly to try to elicit some misconceptions and non-sequiturs that lead her to mistakenly identify SSE with NCE, to judge SSE to have "fundamental internal inconsistencies", and to regard Daly's thought as "unrealistic", "naïve", "utopian", "inadequate" and "problematic". (pp 59-60, *passim*) Because she also elides the 'positive' and 'normative' levels of argument, in violation of basic academic practice, I concur with Farley & Washington that her article is "frankly disappointing to see in the journal *Ecological Economics*." (2018, p 444)[2]

There is some value in scrutinising Pirgmaier's article in some detail, as it is typical of a body of literature criticising or "de-constructing" the theories of Daly, SSE and ecological economics from any of a number of points of view, usually not well-defined, which are virulently opposed, variously, to neo-classical economics, 'capitalism', environmental economics, a focus on money, 'capitalism', and *homo oeconomicus* as a psychological model – all of which are of course, and ironically, opposed or severely challenged, both normatively and 'positively', by Daly, SSE and ecological economics.

2. Pirgmaier's problem with Daly

In conformity with Pirgmaier's treatment, I will use 'Daly' and 'SSE' more or less synonymously. Her argument starts with Daly's, respectively SSE's, stance on *allocation,* although it is the least important, and non-defining, part of SSE. In my critique, and (usually) in Pirgmaier's, allocation means directing natural resources to various *goods-and-services* or *end-uses,* or, as Daly put it in perhaps his most concise and mature statement of fundamentals, "the relative division of the resource flow among

[2] All citations of Farley & Washington are *2018.*

alternative product uses."[3] This is not to be confused allocation *amongst people,* which in SSE is the analytical and policy area of *distribution.*

Pirgmaier's basic claim:

> The problem with endorsing allocative efficiency lies in the implicit acceptance of the neoclassical conception of the economic system and its pillars – the theory of demand, the theory of supply, and general equilibrium theory. These theories establish the building blocks for achieving a Pareto efficient allocation of resources – a downward sloping market demand curve, an upward sloping market supply curve, and the idealised equilibrium position where both intersect. ... [A]ll three theories are internally flawed and detrimental to ecological economic ambitions. (p 54)

Said to depend on NCE, she then claims that SSE becomes a *version* of NCE:

> This paper reveals that steady-state economics is internally flawed as it heavily relies on neoclassical theory and reasoning. By accepting allocative efficiency of markets, the core of neoclassical economics is incorporated into the steady-state framework. The hidden implications of this move are profound. It means accepting a utility-based preference satisfaction account of wellbeing, stable and unquestioned preferences, the neoclassical theory of the firm, general equilibrium theory, rational economic man, instrumentalism regarding the unrealism of assumptions, and a neoclassical definition of what economics is and should be. (p 59)

That is, the allocation-horse containing markets and all the rest, and what they purportedly imply, has been enabled by SSE/Daly (Odysseus) to enter the Troy of ecological economics.[4]

2.1 The hierarchy

Pirgmaier's argument fails, first, because she is identifying SSE (and Daly's thought) with its least important part, allocation theory. Because allocation theory is thus subsidiary, whatever premises or concepts Daly employs in elaborating that part of SSE can have no "profound implications" for the rest of SSE. In order of descending importance, SSE is composed of: 1) its innovative and politically most important principle of sustainable scale, based on inter-generational and inter-species ethics; 2) its principle of just distribution, based on intra-generational ethics; and 3) its non-defining principle of allocation. (Daly 1992, pp 185-88) Remarkably, in light of the almost exclusive importance she attributes to allocation in the rest of her article, Pirgmaier in one place herself correctly sees this hierarchy: "Only after a resource limit and the level [sic] of distribution have been set does efficient allocation become the mechanism to determine the destination of scarce resources." (p 53)

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[3] Daly 1992, p 186.

[4] While in the Troy story there is intent to deceive, Pirgmaier does not argue any deception on Daly's part.

Daly indeed advocates allocation by means of market-determined prices, but these prices are based on a *mixture* of private and public property rights and on a standard *mixed*-economy range of legislative intervention in free markets with respect to education, income re-distribution, public space, natural monopolies, security, etc. (1974a, p 20; passim) That is, the co-author of the book *For the Common Good* is not presuming *laissez-faire* or any other fictitious system of unfettered 'capitalism', but rather socially-embedded markets whose freedom is limited by society's decisions on fairness and other principles conflicting with the maximisation of material wealth. But whatever Daly's mix of freedom and regulation or of private and public property, allocation is decidedly and demonstrably not part of the core of SSE.

Secondly, one cannot logically show that either SSE's or NCE's allocation system can affect, much less destroy, its (or any other) systems of scale or distribution: Scale and distribution are, not only in SSE but in fact in any political economy, prior-determined without any reference to markets for goods-and-services at all, but rather by laws pertaining to natural resources and their distribution amongst people, laws allowing varying degrees of ecological exploitation of resources and varying degrees of equality of their distribution (based on pre-scarcity intra-generational ethics). That is, *even if* SSE were unabashedly soaked in NCE when it comes to allocation theory, the throughput-scale and equitable-distribution issues and practical tasks have both been previously (both temporally and logically) solved. They are logically separate from any and all allocation systems and therefore *immune* to any possible "flaws" in them.

To nevertheless try to connect allocation to the rest of SSE Pirgmaier uses the pictorial term "incorporate", describing a sort of ingestion by SSE as a whole of some debatable or simply false NCE views on allocative efficiency:

> Implicitly, further neoclassical assumptions are *incorporated* by bringing allocative efficiency on board. … [T]he steady-state approach unconsciously *incorporates* the core of an economic theory that is based on a closed systems methodology,… By accepting allocative efficiency of markets, the core of neoclassical economics is *incorporated* into the steady-state framework. (pp 57, 58, 59, *emphasis added*)

These statements however merely *associate* the "neoclassical assumptions" and the "steady-state framework", without revealing any necessary logical connections, which indeed do not exist. For while Daly's *allocation* solutions assume some freedom of production choices, consumer wishes, prices and trading (i.e. markets) – as opposed to strict socialist solutions that eschew markets – his scale and distribution solutions, which are the innovative, most important and defining parts of SSE, have exclusively to do with *pre- or exo-market, political* decisions.[5] They have nothing to do with prices or capitalism or any other property-rights system. These principles, 'pillars' or areas of political policy

[5] Even markets for depletion or pollution permits are derivative, i.e. created in the first place by scale and distribution laws.

can be fully described with no reference to markets or economic efficiency whatsoever. After and in accordance with laws governing scale and distribution, further laws can build any number of frameworks for directing natural and labour resources to particular goods-and-services.

Pirgmaier correctly writes that "Allocation and scale are connected, as the amount of available resources, or a resource cap, would influence what is being produced." (p 56) But this describes a causal arrow working in the reverse direction of her alleged Trojan horse: no causal arrow works the other way, i.e. from systems determining "what is being produced" back towards the already-standing pillars of depletion and pollution maxima and how they are initially distributed amongst people. Neither descriptive nor normative ideas on allocation can infect – carried by a Trojan horse – these two sets of prior social decisions which do not depend or rely on allocation-system choices.[6]

2.2 Regulated market efficiency

SSE differs in several other regards from some assumptions commonly attributed to NCE: SSE declares the ecosystem to be public/commons property, so it cannot have any connection with *private*-property assumptions (Farley & Washington, p 449); the caps or depletion-quota systems which are SSE's preferred scale policy are not 'market mechanisms', as they are very often falsely and bizarrely dubbed, because the derived depletion or pollution permits are defined physically, with no pre-determined price, and do not have to be tradable: The 'trade' part of 'cap-and-trade' applies only to the allocation realm, not the scale or distribution realms; and after scale and initial equal distribution are done, SSE allows further room, which NCE might not, for "minimum and maximum limits on income and the maximum limit on wealth" as well as other market regulations (Daly 1973, pp 332, 333, 349; *also* 1974a, p 20).

One of Daly's descriptions of the "policy goal" of allocation is:

> A good allocation is one that is efficient, i.e. that allocates resources among product end-uses in conformity with individual preferences as weighted by the ability of the individual to pay. The policy instrument that brings about an efficient allocation is relative prices determined by supply and demand in competitive markets. (1992, p 186)

But, as argued just above, the "ability of the individual to pay" is itself partly or even in large part determined by socio-political, legislative (non-market) decisions on initial resource endowment and further ways of distributing or re-distributing purchasing power among people. There is no assumption whatsoever that 'ability to pay' is a fact of nature or varies more than minimally from absolute equality. And Daly is here only normatively asserting that a "good" allocation requires "competitive markets" – not that markets are necessarily competitive or that they cannot or should not be made more competitive by

[6] Malghan 2012, pp 2263-64.

political, legislative means. There is only the claim that, within whatever distributive boundaries are politically set, it is good if decentral reliance on prices raises preference-satisfaction and economic efficiency – all of which, to repeat, happens *within* and *after* the matter-energy throughput limits which have been determined politically and pre-market.

Even once the belly of the wooden horse is opened, ecological economics' stances on the proper size of the material-energy throughput of the human economy in relation to the biosphere, and the degree of inequality within society, are immune to 'economic' doctrines. They have nothing to do with markets, or NCE, or for that matter a "non-market… economic order" which Pirgmaier perhaps prefers (p 59). The *differentia* in the definition of SSE (as opposed to other schools of economics) is its biophysical insight, its statement and solution of the prior scale task. Both distribution and allocation, in fact, are secondary resp. tertiary and are topics shared with all other economic theories. (Daly 1992, p 186)

Markets, prices and allocation in Daly's writings are minor characters. Daly:

> The market is relied upon to allocate resources [to end-uses] and distribute incomes within… the maximum and minimum boundaries… imposed by ecological and ethical boundaries. Setting the boundaries is necessary. (1973, p 349) The market of course functions only within the economic subsystem, where it does one thing: it solves the allocation problem by providing the necessary information and incentives. It does that one thing very well. What it does not do is to solve the problems of optimal scale or of optimal distribution. (Daly 1991, p 257; *also* 1992, p 186; *also* Klitgaard & Krall 2012, p 248)

Nowhere does Pirgmaier spell out what she finds objectionable about this, and she is apparently resistant to seeing that it entails the independence of SSE's ethical, legal structure from markets and 'economics'.

2.3 Faulty syllogisms

There can in the end be only superficial similarities between the ecological system of SSE and the economic system of NCE. Farley & Washington sum up correctly:

> [Pirgmaier] claims that the belief that markets are useful under some circumstances entails complete acceptance of the neoclassical paradigm—a clear example of the slippery slope fallacy. (p 442)

Formally, Pirgmaier is relying on a misconception of SSE's architecture, building the following syllogism:

- NCE is antithetical and dangerous to EE.
- SSE is a form of NCE.
- Therefore, SSE is antithetical and dangerous to EE.

The argument suffers from the fallacy of the Ambiguous Middle Term, for NCE cannot be both merely a view on efficient allocation, as in the major premise, and a comprehensive philosophy relevant to SSE's main concerns, as in the minor premise. But mainly, the minor premise is untrue.

Pirgmaier often cites Clive Spash, who makes the similar claim that Daly is a "new resource economist"; new resource economists "regard ecological economics as nothing more than some sub-field of neoclassical economics", and that Daly & Farley's 2004 textbook *Ecological Economics* is replete with "mainstream economics", holding that a bit of nudging and technology will "make markets work for the common good". (2013, 356) In fact, however, not only is SSE logically far from the mainstream, but Daly and Farley's textbook contains only 2 or 3 chapters, in Part III, specifically dealing with microeconomics, and in one of his seminal articles, for instance, Daly puts economics as a whole discipline into only one of the 4 boxes outlining his SSE. (1968, p 401) Pirgmaier has also evidently drawn inspiration from Spash's warning that ecological economics, being "theoretically grounded in orthodox economics", suffers from the "creep of the neoclassical and orthodox traditions into the movement." (Spash, *ibid.*)

A second, related syllogism entailed by Pirgmaier's analysis leads to an absurdity, starting with Pirgmaier's claim that "In reality, [all] economies need to grow or enter into crises." (p 55)[7] (The minor premise remains the same as in the syllogism given above.)

- All capitalist/NCE economic systems must grow.
- The SSE is such a capitalist/NCE system.
- Therefore, the SSE must grow.

But as we have seen the SSE *cannot* grow. In adopting SSE, society would have forbidden any growth in throughput terms. Thus the conclusion contradicts the basic fact about SSE – unless perhaps, imprecisely, "growth" is being measured in terms of GDP or other non-physical metrics. It would furthermore improve communication if a term such as "capitalism" (e.g. pp 56, 59) were clearly defined whenever used, and we should also not forget that there is no evidence that a system with far more public ownership of the means of production would *necessarily* manifest lower throughput.

In sum, ecological economics does not depend on any particular view of allocation, so is not in danger from that corner, and Pirgmaier's claim is thus baseless that "Thinking through the steady-state edifice step by step reveals that it relies on the neoclassical understanding of the economy" (p 54) or "neoclassical theory and reasoning" (p 60).

[7] I assume she means capitalist, neoclassical economies, not all economies.

3. From the (Trojan) horse's mouth

Refuting Pirgmaier's interpretation of SSE is an opportunity to form in more detail a clearer idea of SSE by showing what she misunderstands or misses. What distinguishes classical, neoclassical and environmental economics from both ecological and steady-state economics is that they don't regard throughput scale as a societal problem in either its depletion or pollution aspects – the examples of some earlier incipient ecological economists notwithstanding.[8] Because it is a-historical, Pirgmaier's treatment cannot appreciate this *raison d'être* of post-growth ecological or degrowth economics for the revolutionary innovation it really is. It is only the realisation of biophysical limits – of absolute scarcity (Daly 1974a, p 17) – which puts intra-generational ethics and sustainability on the agenda. (Daly 1973, p 327) In the 'Cowboy Economy' these are irrelevant. (Boulding 1966)

And as we have already seen, by focusing primarily on allocation Pirgmaier's treatment misses the fact that SSE's embedding the human economy in nature subordinates allocation issues, but she does not seem to be aware of Daly's many elaborations of this basic premise of 'Spaceship Economics'. For instance:

> The new paradigm, however, must begin with physical parameters (a finite world, a complex ecosystem, the laws of thermodynamics) and inquire how the non-physical variables of technology, distribution, and life styles can be brought into a feasible and just equilibrium with the complex biophysical system from which we emerged and with which we are co-evolving. (Daly 1974b, pp 157-58)

Now market allocation of resources to goods-and-services is one of the "non-physical variables" which must conform to the most important biophysical ones; once scale is biophysically limited, that is, this non-physical variable must happen *within* that scale. Yet for Pirgmaier allocation is all-important. SSE's emphasis on normative societal decisions concerning justice and sustainable scale are "admirable", she writes, but this "does not overcome Daly's reliance on allocative efficiency and the problem of an unrealistic and reductive theory of consumption and the economy more generally." (p 54) But "general reliance" in Daly on any of those things is exactly what Pirgmaier does not, and cannot, show: there is no such reliance. Daly is 'relying on' a mixed market system to direct resources to end-uses, but he is not relying on allocative efficiency or any other non-physical variable for anything else at all in SSE theory.

A few more ways in which the above syllogisms' minor premise is false: Daly's familiar *throughput* concept of the human economy's receiving matter-energy from nature and putting it, at higher entropy, back into nature, (Daly 1968, pp 400-01)[9] distinguishes it

[8] *See* Mill 1848, Book IV, Ch. VI, *and* examples in Martinez-Alier 1987.

[9] Daly asserts in 'On economics as a life science' that "Economics is the part of [human] ecology which studies the… life process in so far as it is dominated by *commodities* and their interrelations" and

unmistakably from neo-classical (as well as from much of classical) economics. Furthermore, an economic system's production function is certainly one of its key attributes, and SSE's production function differs fundamentally from that of NCE (a fact further undermining Pirgmaier's claim that SSE "relies on" NCE): While for SSE the factors of production are land and labour, as in classical economics (with capital, *K,* a subset of product *Q*), NCE does without land and natural resources altogether, making *Q* a function of labour, capital and the huge 'efficiency' or technology residual. (Solow 1970, pp 33-38) SSE and NCE seem less like perhaps distant economics cousins and more like members of separate species.

Returning to the point in Section 2.1 of SSE's immunity from any particular view on allocation, Daly has said this in so many words – words which by rights would be taken seriously in any critique:

> The relative price of shoes and bicycles is instrumental in allocating resources efficiently between shoes and bicycles, but is clearly not instrumental for deciding the proper range of inequality in wealth or income, nor for deciding how many people consuming how much per capita of natural resources is best. (1992, pp 186, 188, 190)

Can it be clearer that the fundamentals of SSE 'rely on' only pre-market, political decisions about distribution and scale, with no reference to markets or prices?

Pirgmaier extensively discusses the concept of efficiency without resolving any of its ambiguities.[10] Daly's many efficiency concepts (e.g., 1973, pp 326-29; 1974a, pp 15-16; 1974b, pp 158-61) cover both goods-and-services/throughput ratios and the ratios of different allocative schemes to welfare and the 'Pareto efficiency' concept. While a rise in the former ratio, when holding throughput (at sustainable levels) constant, is nothing to be sneezed at in a world where several billion people live in poverty,[11] allocative efficiency (where the output is welfare or either total or average satisfaction) can be only imprecisely judged since the output is notoriously hard to quantify. (Daly 1974b, p 159) The calculation of benefits or overall 'social welfare' is fraught with problems acknowledged by all concerning initial endowments, later ability to pay, and ethical decisions about who counts, issues that remain unaddressed by Pirgmaier.

Instead of addressing and debating these topics, Pirgmaier expresses opinions based on a conflation of intra- and inter-generational issues. She first quotes Daly's description of a *good* allocation (quoted already in Section 2.2), that a [relatively] efficient allocation

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ecological economics is at the mutually-fruitful intersection of biology and economics (Daly 1968, pp 392, 398-99). 'Human ecology' is arguably a better name for the new field 'ecological economics'.

[10] Efficiency is always a *ratio* between two quantities, and as such – look at it mathematically if you wish – simply cannot have any direct effect on the absolute quantities which are the concern of scale.

[11] Remember that degrowth does not refer to fewer goods and services, but to lower throughput(s); material welfare, overall welfare, and the total quantity of 'stocks', people, goods, and services can legally expand, and along with them GNP, as long as the scale limits are not overshot. (Daly 1973, p 330; 2008, p 3; O'Neill 2015, pp 553-54) The SSE is more a sustainable rather than a 'stationary' economy.

> …allocates resources among product end-uses in conformity with individual preferences as weighted by the ability of the individual to pay. The policy instrument that brings about an efficient allocation is relative prices determined by supply and demand in competitive markets [Daly, 1992: 186] (p 53)

Recall first that this view has no effect on the political scale and distribution-of-resources decisions, and that there is much else to unpack here. Yet she immediately asserts that

> This framework is supposed to be substantially different from the standard environmental economics solution of 'getting the prices right'. (p 53)

I believe that is indeed "substantially different". One difficulty is that Pirgmaier here does not specify whether the "standard environmental economics solution" is for the allocation, welfare, or scale problem. Only if it were applied to the latter would it conflict with SSE and ecological economics. This is an example of associative writing which conceals a simple change of subject: In the quoted passage Daly is not talking about throughput scale, while environmental economics – presumably a branch of NCE – might be. SSE's core principle of attaining environmental solutions without any reference to prices at all is therefore *misrepresented*.

Another of many examples of the huge distance between NCE and SSE can be seen in Daly's attitude towards GNP:

> But the definition of the SSE is in terms of physical stocks and throughput and is not affected by whether or not service could increase indefinitely. … The concept of a SSE is independent of GNP, and what happens to GNP in the SSE simply does not matter. The best thing to do with GNP is to forget it. … (1973, pp 329, 330, 331)[12]

No self-respecting neo-classical economist could write such a thing.

Daly's way of categorising caps systems is likewise distinct from that of NCE:

> It is clear that scale is not determined by prices, but by a social decision reflecting ecological limits. Distribution is not determined by prices, but by a social decision reflecting a just distribution of the newly created assets. (p 188) Tradeable permits have been considered [by mainstream economists] the individualistic "free market" solution, without emphasizing that this market is free only after having been firmly and collectively fixed within scale and distributive limits. (p 189)

Pirgmaier, however, persists in claiming that SSE is "basing central theories of ecological economics on" NCE, that "the steady-state approach unconsciously incorporates the core of [NCE] theory". (pp 59, 58) But again, even if SSE's view of

[12] This paper, like Pirgmaier's, does not address the undoubtedly fruitful issue of whether SSE entails caps on material-energy throughput only, or also on stocks, e.g. human population, livestock, buildings, square meters of asphalt, etc., *but see*, on population, Farley & Washington, pp 443, 446.

allocation were “based on” NCE, it is not a “central theory” of either ecological economics or SSE.

Finally, Pirgmaier apparently assumes that any economic analysis in terms of costs and benefits must make one beholden to NCE because it shows “neoclassical microeconomic reasoning” (p 55) – as if business and managerial microeconomics, as well as all animal and plant evolutionary-behaviour theory, all building centrally on the concepts of costs and benefits – were “neoclassical”. Yet what Daly actually does is prevent any co-option of the terms ‘cost’ and ‘benefit’ by NCE – especially if their metric is monetary – with a more nuanced concept:

> The distribution and scale questions, like the allocation question, are *economic* in that they involve costs and benefits. But the dimensions in which costs and benefits are defined are different in the three cases. Allocative prices are not even relevant to estimating the costs and benefits of scale expansion, just as they are not relevant to estimating the costs and benefits of a step towards a more equal distribution of income or wealth. (1992, p 190) At some point the rising marginal costs of physical growth will begin to exceed the falling marginal benefits. To grow beyond that point would reduce welfare rather than increase it. Therefore physical growth should stop at that point. This economic limit should be the controlling limit. (1974b, p 151)

Pirgmaier’s associative thinking, it seems, prevents her from considering that the social, political weighing of pros and cons can be accurately described as a weighing of benefits and costs, with no reference to their use in any narrower *chrematistic* or business-bookkeeping sense.

4. Related weaknesses

It is difficult to critique Pirgmaier’s critique – more accurately called an “attack” (Farley & Washington 2018, p 448) – because of a certain abstraction or vagueness. She for instance ten times says no more than that despite the good principles she, as an ecological economist, shares with SSE (pp 53, 55), this or that assumption or reliance is “problematic” (*passim*). A related weaker claim is that “the *way* [Daly] suggests to implement this vision is problematic” (p 55, *emphasis added*), a claim which conflates analysis and implementation. In addition she variously characterises NCE as a “reductionist, ahistorical, asocial and apolitical … ‘emperor [who] has no clothes’” (p 56); as “static, universal, purely subjective and individualist” (p 59); as “unrealistic” and stuck in “naivety and utopianism” (p 59); and in taking “preferences as given” it “reflects a deliberate choice to abstract from any ethical content…” (p 55). She then rhetorically transfers NCE’s negative attributes to Daly and SSE – leading in the case of the last quotation to the *absurd* conclusion that Daly leaves ethics out of his economics.

A perhaps minor example of this transference (guilt) by association is the claim that Daly must assume “insatiable consumer wants” (p 57), something that is explicitly,

black-on-white rejected by Daly (1974a, p 18; 1974b, pp 152-53). Another is that “the steady-state approach” commits an “analytical separation of economics from politics, positive from normative, and allocation from distribution [and] frames political and moral issues as technical exercises, thus depoliticising politics [sic]” (p 57) – a claim which, assuming I understand it, cannot imaginably be more false given that Daly’s very innovation was to look at economics through ethical and political starting-principles; I believe that ecological economics put the ‘political’ back into hoary ‘political economy’. She also states that SSE is “heavily infused with ‘old’ neoclassical economic thinking… regarding static equilibrium or externality logic.” (p 56) Aside from the vagueness of the term “infusion”, what Daly actually asserts is an *analogy* between the economy and living organisms, both in a “steady-state thermodynamic *dis*equilibrium”, (1968, p 396, *emphasis added*)

Similarly, if I correctly follow her criticism of Daly’s alleged view of externalities, she regards his use of that term, and that of ‘market failure’, as objectionable because “This is the same logic and language as in standard environmental [neoclassical?] economics.” (p 57) This is again associative, criticising the *mere use* by Daly of some mainstream words (in order to talk to and perhaps convince some members of his profession?). She seems to be basing the indictment on isolated sentences, for instance one buried in Daly’s 5-page treatment of depletion quotas (1974b, pp 162-66) where he says they “*can be* regarded as the correction of a market failure” (*emphasis added*) – latching onto the phrase ‘market failure’ out of NCE’s lexicon and building the indictment without regard for the context of Daly’s treatment.

That Daly, well-known to have a good sense of humor, is not using the “same logic” is shown by his ironic statement that

> Externalities involving ecological, demographic, and distributive issues are "externalized" by means of quotas rather than "internalized" in rigged market prices. (1974a, p 20)

Whether the quotas externalize or internalize the other issues, the picture is thought-provoking because it removes those issues from economics, seen as having by definition to do with prices and markets, altogether. It is politics, based on ethics.

More strongly, the assertion is that in SSE’s solution to the ethically *inter*-generational problems of scale through caps or depletion quotas, those pervasive environmental externalities *no longer exist;* they have been legislated out of existence. In the here-and-now, though, i.e. *intra*-generationally, there is a range of externalities dealt with in environmental-economics textbooks such as noise, ugliness or end-of-pipe toxins which can be eliminated by prohibitions or reduced by tax-caused cost increases. Regarding those burdens (some level of which society tolerates), what is the objection to using the tool of ‘internalisation’, even if by means of prices? As Daly wrote with exemplary modesty of the internalisation concept,

> It would be easy to liken this concept to a *deus ex machina* lowered into the scene by our theoretical playwrights to save an awkward plot, but it is by no means easy to suggest a better treatment. (p 400)

'Externalities' and 'market failure' are two of many examples of concepts straddling many schools of economics and requiring nuanced inspection. Pirgmaier however only associatively claims that Daly's "reasoning is not fundamentally different from standard market failure theory." (p 57)

At the risk of getting into a technicality, another minor soldier hiding in the Trojan horse is said by Pirgmaier to be the SSE's "unrealistic, flawed and inconsistent" adoption of "upward sloping" supply curves:

> The result of constant or falling production costs for most manufactured goods is flat or downward-sloping supply curves. This is no mere technical detail. It matters as Daly derives misleading conclusions about the functioning of the economy." (p 55)

But the slope of a supply curve has nothing to do with changing *production costs,* only with changing prices. It describes only *willingness* to bring something to market at a given price, and assumes neither falling nor "rising per-unit production costs with rising output" (pp 54-55). Pirgmaier seems thus to be confusing the slope of a supply curve with a *shift* in a supply curve, which indeed is a function of marginal costs or profits, or perhaps even with a curve plotting supply *over against time* rather than price*,* which can yield all sorts of slopes. Because of the failure of this attempt to refute some concept of upward-sloping supply curves – which belongs incidentally to classical economics, not just NCE – there are no "misleading conclusions" to be drawn from them, by Daly or anybody.

Pirgmaier furthermore conflates a discussion of a biophysical vs a monetary conception of the economy with a discussion of exchange- vs use-value. She first praises Daly's rejection of the NCE circular monetary-flow picture in favour of the directional throughput picture, but then, about his return to classical economics' concept of use-value, says this:

> Daly's move is admirable as it attempts to emphasise use value aspects that are neglected in mainstream economics. However, the way this is done is inadequate. A biophysical perspective of the economy attached to a flawed neoclassical theory does not yield a satisfactory theory. (p 58)

First conceding that an author treats an issue substantively correctly, then objecting to the "way" the author does it (as vaguely "inadequate"), conveys however no information. But if my guess as to Pirgmaier's meaning is roughly correct, it must be said that the "biophysical perspective" of SSE cannot be said to be "attached" to either the flaws or the virtues of NCE. Rather, this perspective is a revolutionary *rejection* of NCE's blindness to biophysical context and its chrematistics (its neglect of use-value in favour

of exchange-value). Moreover, her treatment here of use-value is written as if it was not Daly who often wrote about the water-diamonds paradox![13] But most puzzling of all is her observation that:

> However, as complexity rises from natural to social systems…, dynamics of the economy cannot be exclusively explained in biophysical terms. There is more to inflation than atoms and molecules. (p 58)

Did anybody at all ever try to explain economic phenomena without referring to human beings? The idea that Daly deals only in "atoms and molecules" is over-the-top.

In a final example Pirgmaier attacks SSE for its alleged sharing with NCE a "neglect of interdependencies, dynamics and change". She does this first by attacking *analysis as such*:

> Another problematic consequence of the steady-state approach is the perpetuation of analytical separations. Scale, distribution and allocation are presented as analytically separate entities that can be implemented by separate institutions. In practice, it is impossible to uphold this distinction. … [Ecological economics] needs to conceptually grasp interdependencies, relations and feedbacks rather than trying to separate them out. … [A] theoretical framework is needed that focuses on a comprehensive understanding of interdependencies. … [A]llocation, distribution and scale cannot be treated separately from each other. … There are alternatives beyond analytical separation. (pp 56, 57)

First of all, it is asserted without any proof that upholding these distinctions is "impossible in practice". Why? This must be shown concretely, on the failure of some practical system such as SSE's, but Pirgmaier doesn't show any practical failures.

But the deeper problem is logical. Not only does this passage contradict Pirgmaier's own *acceptance* of the analytical separations between scale, distribution and allocation (e.g. on p 56), it must be rejected *a priori* because identifying interdependencies logically *presupposes* separating out the things that are interdependent. Dependencies between ('inter') X, Y and Z depend, if you will, on prior "analytical separation" of X, Y and Z. Otherwise we don't even know what X, Y and Z are.[14]

The depth of Pirgmaier's lack of understanding of SSE shows in her hard-to-follow conclusion that:

> If steady-state economics is to move beyond a perspective of the economy as an end in itself (which Daly advocates) towards one in which the economy is a means to serve society at large, then efficiency too, is a means to achieve scale and distribution, which are clearly more important. (p 56)

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[13] Daly 1968, p 394.

[14] Specifically concerning dependencies, or indeed the *lack thereof*, between scale, distribution and allocation, obviously presupposing "analytical separation", *see* Daly 1973, pp 350-54; Daly 1992, pp 188-89; *and* Malghan 2012, pp 2263-64.

If Pirgmaier can quote advocacy by Daly of the view that “the economy [is] an end in itself”, she must show it to the reader. In fact, of course, it is precisely such “moving beyond” which Daly has advocated during the last fifty years, as proven for instance by this passage:

> The notion that systemic vital costs of collective behavior (greenhouse effect, ozone depletion) are best dealt with by pretending that every individual could and should, on the basis of assumed perfect knowledge, decide his or her own willingness to pay to avoid the loss of such services, is not an idea that comes easily to the unprejudiced mind. It requires years of indoctrination in “methodological individualism”. … Distribution and scale involve relationships with the poor, the future, and other species that are fundamentally social in nature rather than individual. *Homo economicus* as the self-contained atom of methodological individualism, or as the pure social being of collectivist theory, are both severe abstractions. Our concrete experience is that of ‘persons in community’. (1992, pp 187, 190)

Perhaps obviousness blinds. SSE is diametrically different from NCE’s “definition of what economics is and should be.” (Pirgmaier, p 59)

But in terms of content, Pirgmaier is in the above passage (from her p 56) apparently agreeing that scale and distribution are more important than allocative efficiency, in which case SSE is cleared of the charge of associating closely with NCE. She is also saying, also apparently, either that allocative efficiency *can* “achieve” scale and distribution results (it is a “means to” it), and/or that SSE *should* enlist efficiency in achieving these. But there is overwhelming evidence that the technological type of efficiency (it is not clear of which type Pirgmaier is speaking) does not by itself limit, but rather increases, biophysical throughput – covered by a huge literature on rebound effects or Jevons’ Paradox (Alcott 2005). Again, Pirgmaier shows no awareness that Daly and SSE have simply severed the logical connection between allocation and the other two realms.

5. Discussion and Conclusion

Pirgmaier moves from Daly’s sins of commission to a sin of omission in attacking SSE’s supposed *inability to explain* either “how capitalist dynamics relate to ecological disruptions” (p 59) or “how growth dynamics emerge… or why society changes” (p 53):

> [E]cological economics requires sound theories that explain the emergence and dynamics of social economic phenomena. (p 53) … [W]e need to systematically understand how the dynamics of capital accumulation relate to scale and distribution. For instance, we need to ask why, how and under what circumstances labour and resource efficiency improvements drive the expansion of the economy as a whole. (p 56) [We must] better understand environmentally destructive feedbacks of the system as a whole. (p 60) The lack of a realistic conception of growth and power dynamics constitutes a central critique of steady-

> state economics. … A ‘good’ theory … should … offer deep explanations why current economic development trajectories and policies prioritising GDP growth are unsustainable and increasingly unjust. (p 59)

That is, neoclassical, and by implication steady-state, economical “foundations cannot provide sound theories of growth dynamics, profit, money or distribution, which are key to understand the contemporary political economy landscape.” (p 59)

But why should SSE possess such complete knowledge? I would like to suggest that ecological economics (or SSE) do not need any such explanations naming the socio-economic drivers of throughput growth at all – first of all as a practical matter, because it limits throughput growth directly, legislatively, not by tinkering with technology, property-ownership systems, the money system, city planning, Gini co-efficients, work-time, and various efficiencies. These might be drivers in mixed economies lacking any prior, legal restraints on resource exploitation. In any political economy military or security ‘needs’, or a drive for international prestige, or a false belief that employment rates depend on economic size and economic growth, might ‘drive’ throughput growth. But in SSE it can’t be ‘driven’ because that is illegal. The ‘drivers’ are impotent. The societal caps on throughput scale have done the environmental work.

To ignore this, and continue to trace all possible indirect causes and (ineffective) remedies for unsustainable ecological size, is to decline to deal with SSE on its own terms.[15]

That is, to theorise and describe its core pillars ecological economics does not actually need knowledge of how throughput became unsustainably large or unjustly distributed – only *that* it is. To identify overshoot and unsustainable pollution, and motivated by the normative need for lower throughput, SSE depends only on natural and environmental science, including human physiology and health, and on the values of citizens. To the extent that there is indeed leeway in determining exact limits, they depend only on the political decision process, whereby what is acceptable is democratically determined. For this, and to realise that caps or quotas are sufficient to achieve reductions to desired levels, and to democratically define what ‘fair’ distribution is, we need none of the knowledge described by Pirgmaier above.

That is, Pirgmaier and some writers she relies on seem to be asserting that in order to present good descriptions and remedies for unsustainability, a *macro-economic ecological economics* needs to understand real-world income distribution, financial markets, growth theory, ‘green’ investment, the macro-economic rebound effect and even business cycles. (*see e.g.* Klitgaard & Krall 2012, pp 250-51; Rezai & Stagl 2016,

[15] There is moreover something Nero-like about ecological economists’ understanding every nook and cranny of capitalist dynamics, and ignoring SSE’s crucial achievements while developing all sorts of ‘heterodox’ economic theories (pp 56, 59-60) while throughput runs rampant and income inequality worsens. Perhaps our energies should go into better design of cap-and-distribute systems.

pp 183-84) Nothing against knowledge for its own sake, but to know for instance that "a biophysically non-growing economy is [not] compatible with capitalist accumulation dynamics" (Pirgmaier, p 56) is – if it is even true – irrelevant, because SSE advocates a political decision for throughput shrinkage whether its causes are capitalistic, socialistic, theistic, nationalistic, militaristic or universally human-psychological. In Pirgmaier's example, SSE can say 'tough luck for capitalist accumulation dynamics', or human greed, and leave it at that. If there are "unhealthy growth imperatives" in today's system (Hahnel 2012, pp 30-31), too bad for today's system, which in SSE has been replaced *ipso facto,* sort of as an afterthought, by one whose first principle is that throughput growth has stopped.

However, the *social-marketing*, or political success, of SSE is another pair of shoes. In order to convince 51% of voters in a democracy of its desirability, there are, it would seem, no prior-determinable limits to what we must know about today's system and mainly about the *people* who could vote to change them – such knowledge would be more psychological and sociological than economic, I think. But this is a wholly different task from developing policies which would solve the ethical problems of dealing with ecological limits, which SSE has already done.

Pirgmaier for instance reasonably says that much hinges on "a sensible theory of profit … *to understand* … *resistance to* resource caps or distribution policies." (p 57, *emphasis added*) And perhaps she means social-marketing when she several times speaks of SSE's alleged weakness in "implementing" its project. Indeed, we should all try to understand "why steady-state proposals face extreme implementation barriers". (p 53) We should indeed anticipate the effects of degrowth on employment levels, and for instance through Transition Towns practice for the inevitable de-grown economy, as part of establishing the SSE in a democracy. Yet Pirgmaier only dismissively and without evidence says, "The steady-state project remains a rather *shallow* attempt of listing normative goals and policies that bear little resonance to real-world implementation challenges." (p 59)

It might just be that Pirgmaier's dissatisfaction with Daly concerns the age-old discussion about individual freedom. Farley and Washington, with Daly (1974a, p 19; 1974b, p 162), opine that

> Once scale has been centrally determined, an individual's decisions do not impose additional ecological costs on others, and weighting preferences by purchasing power is not unreasonable when just distribution ensures equitable purchasing power. Under these circumstances, voluntary market exchanges can generate Pareto improvements. (p 446)

Notwithstanding that SSE's position on scale is based on a 'socialistic' *commons* concept of ownership of natural resources – otherwise society would not have the right to limit individuals' access to or pollution of them –, one can disagree on issues of economic freedom vs economic socialism without claiming that one or the other answer

will take down the entire architecture of SSE. It is I believe important for wider debates within the degrowth and ecological-economics communities to realise that SSE's positions on scale and distribution, based by the way on political-economic principles that are far more socialist than capitalist, are not affected by positions concerning egalitarianism, ownership structures, and the role of markets *within* SSE's ethical boundaries.

Pirgmaier's apogee:

> If neoclassical theory is dropped,… steady-state economics remains a rather *shallow* normative framework stipulating that the economy 'should' stay within the limits of the ecosystem and that resulting [sic] distribution issues 'should' be tackled in a relatively just way. … However, adding an ethnical and ecological *taste* to *wormy* theory does not transform it into 'new' economics – it remains 'old' economics with add-ons. … Adopting the scope, reasoning, and core assumptions of neoclassical theory and adding a biophysical and ethical *flavour* to it does not lead to its [ecological economics'?] improvement, but rather to fundamental internal inconsistencies between the 'old' economics paradigm and 'new' progressive ecological economic thinking. (pp 53, 55-56, 59-60; *emphasis added*)

SSE, that is, works in NCE's kitchen adding a bit of seasoning; if SSE and NCE do meet, the resulting theory would still be "wormy". Such *disdain* for Daly and SSE (who have merely thrown in a few "add-ons") and for "old" economic theory even though it contains the many towering insights of classical economics is, in my opinion, out of order.

But not only is the above dismissal of SSE descriptively wrong and emotionally presumptuous, in opining that SSE's ethics are mere flavouring, Pirgmaier is herself showing disregard for ethics: if its normative principles are "shallow", if its 'shoulds' are mere additions to a mix, this implies that ethics itself is in the back seat: Whether degraded as "flavour" and "add-ons" or not, SSE's inter- and intra-generational principles determining scale and distribution are both the core of SSE and are nothing if not ethics. With her own critical focus on allocation, moreover, she is denying the importance of this inter- and intra-generational ethical thought – the thoughts that launched ecological economics in the first place – to say nothing of Daly's and SSE's view that nature has intrinsic value (Daly 2014).

To conclude, because there are no necessary logical links between any theories of scale or distribution and policies of allocation it is false to associate Daly and/or steady-state economics with neoclassical economics. One sympathises with Farley & Washington's view that Pirgmaier's article "effectively seeks to malign and dismiss" Daly and SSE (p 448), for she reduces SSE to a branch of NCE:

> [Daly] only proposes to extend the scope of neoclassical economics. The way in which this is done is to wrap 'the allocation problem' of neoclassical economics into a biophysical and

> ethical corset by adding sustainable scale and just distribution as additional goals (and to introduce a new measure of ultimate efficiency that captures the broader scope). (p 55)

Not only does one wish a more respectful tone, but “absolute resource limits” and “fairer distribution” are by definition anything but “additional” in any theory of a sustainable economy, and any critique of any such theory should start and deal with this realisation.

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