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Learning to Treat Our Natural World Realistically Through Unlearning Mainstream Economics?

A Commentary on the Recent Work of Peter **Söderbaum**

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Introduction: From Climate Emergency to Economics as Context

It is now well publicised that we have entered a period of recognised 'climate emergency' and ecological breakdown (Ripple et al., 2020, 2021; Morgan and Steffen, 2021).[2] Scarcely a day seems to pass without another reported event somewhere in the world linked to climate change: forest fires, storms, floods, droughts… And scarcely a week seems to pass without the publication of another dataset or report from the IPCC, UNEP, or one of many other UN agencies, government equivalent, research centre or NGO drawing attention to some significant metric: global greenhouse gas (GHG)[3] emissions levels (typically in Gigatonnes carbon dioxide and equivalents or $GtCO_{2e}$), cumulative atmospheric emissions levels (typically as atmospheric CO_2 parts per million or ppm), average global temperatures, regional temperatures, glacier retreat, sea ice depletion, sea level rises, plastic accumulations, eutrophication effects, water table problems, soil depletions, desertification, loss of biodiversity and species extinction and so on. The direction of travel continues to be grim. For example, according to the 2020 UNEP 11th annual *Emissions Gap Report* global GHG emissions increased by 1.1% in 2019, excluding the effects of land use change (LUC) and 2.6% in 2019 if LUC is included, and this followed a 1.4% average annual increase (including LUC) for the whole decade (UNEP, 2020). Depending on how measured the emissions range extended in 2019 from 52.4 to 59.1 $GtCO_{2e}$ but in each case was an annual record high for that category of measurement. In January 2021 the Copernicus Climate Change Service reported global average temperature in 2020 was 1.25 °C above the pre-industrial average and parts of the Arctic and northern Siberia reported 6 °C above a 30-year baseline average. In the same month the UK Met Office, forecast cumulative emissions in the atmosphere for 2021 to average 416.3 ppm (an annual increase of 2.29 ppm), varying above and below 417 ppm for the year (since during the growing season in each hemisphere ecosystems tend to absorb more CO_2 creating regional offsetting effects). 417 ppm is 50% higher than the pre-industrial level (late 18th century).[4]

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[2] The Alliance of World Scientists has been organised to coordinates pressure on governments and create public awareness of the urgency of the climate emergency. For example: Despite promising developments, the need for climate action has grown even more urgent this year - read 'The Climate Emergency: 2020 in Review': https://bit.ly/3nk4QXt

[3] The Kyoto protocol defined the GHGs as: Carbon dioxide (CO_2), Methane (CH_4), Nitrous Oxide (N_2O), Hydro-fluorocarbons (HFC), Perfluorocarbons (PFC), Nitrogen Trifluoride (NF_3) and Sulphur Hexafluoride (SF_6).

[4] This is not the first time ppm somewhere in the world exceeded 417 ppm. The claim is rather that the average will be persistently around this figure across the world and that 50% is a major milestone. Data is draw from Mauna Loa Observatory in Hawaii which has the longest continuous records for atmospheric ppm, starting 1958. Previous estimates use analysis of air bubbles found in ice cores drawn from ice sheets. The late 18th-century level is estimated at 278 ppm.

The backdrop to these reports is now the Paris Agreement of 2015, which comes into full force in the present decade and behind this, energised by the IPCC *Global Warming of 1.5 °C* report (IPCC 2018), in turn, sits the new set of targets for net-zero emissions by mid-century and various targets to reduce emissions from the 2017 level by 45-55% by 2030. And *all* of this takes as its point of reference a carbon budget which links emissions levels and cumulative atmospheric emissions to likely climate effects (e.g. Steffen et al., 2018). Estimates vary, but most models place the total budget at the lower end of 3,000+ $GtCO_2$ to restrict warming to 2 °C and we have already emitted in excess of 2,000 $GtCO_2$. The 1.5 °C goal reduces the remaining budget still further, and the remaining budget may be as little as 238 to 349 $GtCO_2$ if we are to achieve this restriction to 1.5 °C (see Wildauer et al., 2020, p. 9). At current emissions rates we are clearly going to rapidly exceed this budget. Just $GtCO_2$ without equivalents was 42 in 2018 – hence the growing sense of emergency. To be clear, 1.5 °C may not seem like much but its significance is not as a locally experienced temperature effect (mere weather) but rather the fundamental effects on climate systems and patterns induced by this average change.

Carbon budgets, carbon footprints and many other related metrics are something we are likely all going to be required to become familiar with over the coming years. And it is now notable that governments and corporations have begun to acknowledge the need for urgent action. Most countries have signed up to Paris, the US has, of course, just recommitted, China has recently shifted its targets and the UN reports an increasing number of governments committing to net-zero by mid-century – the UN Climate Ambition Alliance is working to encourage countries to increase the ambition of their 'nationally determined contributions' to emissions reduction (NDCs) and has also launched the 'Race to Zero' campaign to feed this through to cities, regions, business and other actors.[5] The growing prominence of 'Green New Deal' (GND) policy and investment programmes has begun to frame this apparent transition – for example, the EU is currently working towards a GND. In the language that has become the familiar parlance of global environmental and climate discourse, key actors seem to be finally waking up to the fact 'business as usual' is untenable. The pertinent question, however, is whether this constitutes an embryonic transformation.

Criticism of 'business as usual' is, of course, not new and nor are calls for action. The UNFCCC global framework to address emissions dates back to 1992 and concern began much earlier. In 2008 Clive Spash wrote:

> 'Well, we've been here before. Major international political attention was first paid to climate change in 1988. At a meeting in Toronto, governments agreed to 20 percent cuts in CO_2 emissions by 2005. The same year, the Hamburg World Congress recommended 30 percent cuts by 2000 and 50 percent by 2015 (with some dissenters). However, instead of government action, we only saw the IPCC established to "study" the issue further. A decade later, Kyoto's few percent emissions cuts for developed economies were still seeking ratification' (Spash, 2008, p. 4).

The vast majority of countries eventually signed up to Kyoto, its subsequent expansion and/or related initiatives (beyond the 'Annex Parties') yet the 2019 UNEP ten-year assessment of the previous decade is stark – amounting to an admission that policy, of which there has been a great deal (through the Kyoto Protocols and their extension at Copenhagen 2009, Cancun 2010 and Doha 2012 etc.), had so far made little difference:

[5] For the climate ambition alliance see: https://cop25.mma.gob.cl/en/climate-ambition-alliance/
Visit Race to zero at: https://unfccc.int/climate-action/race-to-zero-campaign See also Appendix A.

> 'The current level of global GHG emissions is by now almost exactly at the level of emissions projected for 2020 under the business-as-usual, or no-policy, scenarios used in the Emissions Gap Reports, which are based on the assumption that no new climate policies are put into place from 2005 onwards. In other words, essentially there has been no real change in the global emissions pathway in the last decade' (Christensen and Olhoff, 2019, p. 3).

The very need for urgent action at this time raises questions concerning the capacity and commitment of global organisations, countries and corporations to *really* address the causes of climate change and ecological breakdown. As the UNEP ten year assessment report goes on to say, 'The effects of climate policies have been too small to offset the impact of key drivers of emissions such as economic growth and population growth' (Christensen and Olhoff, 2019, p. 3). Clearly, there are fundamental issues to address in terms of unmaking futures we have set in motion and there are related issues in terms of unlearning theory that has informed policy and has affected public understanding of the nature of our economies, since this got us to where we are – i.e. a state of climate emergency, despite recognition years ago there were basic problems that needed to be solved. This bring us to the work of Peter Söderbaum.

Peter Söderbaum is professor emeritus in ecological economics at Mälardalen University, Sweden. He has been involved since the 1970s in developing an interdisciplinary curriculum for the purposes of sustainable development and his work marks him out as one of the early critics of mainstream economics' lack of due attention to an economy's ecological and climate consequences.[6] Over the decades he has done a great deal to promote awareness of key issues and is particularly well-known for his critique of neoclassical economics' paradigm dominance. According to Söderbaum, the absence of pluralism in economics has consequences for the diversity and scope of democratic deliberation, narrowing these to the detriment of sustainable development, a term which he argues also needs careful scrutiny. Söderbaum has written many articles and a series of books exploring these and related issues (e.g. Söderbaum 2000; 2008; 2018[2016]). His most recent essay for *Economic Thought* (Söderbaum, 2021) provides an opportunity to address some of the underlying issues regarding the role of economics and of pluralism. In the following section I briefly set out his latest work in the context of his previous work and then move on to provide some elaboration on the core themes. Doing so will return us to the question of climate emergency and embryonic transformation.

Positional Analysis, Pluralism and Paradigm Co-existence

In his latest paper, 'The Challenge of Sustainable Development' Söderbaum reprises themes from his previous work.[7] According to Söderbaum, neoclassical economics remains the dominant paradigm in economics and this is mainly what is taught in economics departments. This paradigm has key features. It is 'technocratic' and this is not just because it places great emphasis on mathematics and quantification, but because mathematics is typically used as though it were a 'neutral language'. Furthermore, its use tends to convey the impression that

[6] Peter is interviewed by Malgorzata Dereniowska for the WEA Pedagogy Blog at: https://weapedagogy.wordpress.com/2018/04/24/dialogos-economics-education-and-pedagogy-an-interview-with-peter-soderbaum/

[7] In what follows I have reduced, ordered and paraphrased Söderbaum's argument. This is necessarily a combination of selection and embellishment. Söderbaum may, of course, contest how his work is represented, but I would note this was done with constructive intent.

its derived output has objective truth content, rather than are conditional truth claims with an underlying set of value orientations that infuse neoclassical economics as one among many potential perspectives. The consequence of this is that neoclassical economics' theoretical framework tends to become *the* framing of how the world is and should be (from an economic point of view) and its conceptual components tend to influence how problems are posed and how policy is expressed. Conceptual components, moreover, come in combinations. For example, theory is framed in terms of tendencies to an equilibrium, where some defined optimal state is achieved and problems are stated as deviations from this optimality, subject to further conceptual criteria such as forms of efficiency, degrees of failure etc. And, since this framing theorises and measures its parts based on monetary valuations it tends to define goals, express problems and identify policy in terms of monetary valuation in general. This is a highly restrictive perspective, but it is one that sits easily with the central role that corporate profitability and GDP measurement and targets play in contemporary (neoliberal) economic life.

Söderbaum, by contrast, is a longstanding ('institutional') advocate of ecological economics and whilst there is some diversity within ecological economics, a core commitment is that it is an error to focus only or predominantly on the quantification of processes of exchange value (prices, monetary costs, profits etc.). An economy is a material process involving resource and energy use, entropy and waste creation. Economies in aggregate constitute a collection of subsystems embedded in and dependent on, but able to effect, the complex processes which comprise an Earth system (aspects of the biosphere, climate etc.). As such, it is fundamentally important that the scale and intensity of economic activity is theorised and researched in terms of its consequences for that Earth system. If this is not done effectively then economics is unable to provide an adequate guide to sustainable development and instead unsustainable tendencies may be enabled and perpetuated to the detriment of both human well-being and the environment on which that well-being depends.

It is against the background of ecological economics (and I have elaborated slightly here) that Söderbaum suggests the 17 UN Sustainable Development Goals (SDGs) are compromised and techniques, tools and methods built around neoclassical economics are problematic. For example, the use of neoclassical Cost-Benefit Analysis is problematic as a way to expedite investment in infrastructure and to orient and facilitate mitigation and adaptation activity. This, in turn, illustrates the narrowing of perspective based on a technocratic approach. Ultimately neoclassical economics is not just narrow (conflating quantification with scientific status, despite that it pays little to no attention to the material processes of its primary object of study), it is an exclusionary paradigm and as such it has been antithetical to pluralism. According to Söderbaum, however, economics needs to become and remain pluralistic and this is for a variety of reasons. Since paradigms are value-laden then each constitutes a framework of ideas and these can be legitimately different regarding social goals, ways of organizing society and ways of living. As such, there can be a range of economic theory and this ought to be reflected in the teaching of economics. This, however, is compromised if we view paradigms in competition, with a view to converging on a single correct paradigm. Furthermore, since paradigms can encapsulate worldviews and operate as ideology it is important to both teach students that economics can be ideological and to expose students to multiple ideologies. This, in turn, allows economics to contribute to democratic deliberation within society. Moreover, this economic pluralism is compatible with the development of an institutional ecological economics as one way to contribute to sustainable development.

From the point of view of 'positional analysis' (PA) difference and disagreement are normal in a democratic society and argument and advocacy can lead to learning. Economics

can be a discipline that facilitates learning by both acknowledging its own diversity and by more adequately defining what it covers. So, for Söderbaum, from an institutional ecological point of view, economics is 'the management of (limited) multidimensional resources in a democratic society' and this multidimensional analysis embraces measurement of material processes (in order to create awareness of thresholds and irreversible effects on climate and ecological systems) but also non-monetary valuations in and of society – allowing one to move beyond an overwhelming focus on a circular flow of income as though the economy were a perpetual motion machine, and move beyond mechanistic measures of GDP. This more nuanced approach allows greater diversity of type and motivation to be attributed to active agents (individuals and organisations) in society. With this diversity in mind, he proposes basic concepts of 'Political Economic Persons' (PEPs) and of 'Political Economic Organisations' (PEOs). According to Söderbaum these concepts allow economics to both recognise the range of values and motives individuals and organisations might have, which affect their decision-making, but also to engage them constructively across that range, from consumption to more other-regarding community or citizen positions.

Söderbaum also suggests 'a "political version of network theory" as useful for the purpose of understanding markets in relation to sustainable development and democracy'. Network analysis enables mapping of roles, values, responsibility, current conflicts of interest, but also areas conducive to cooperation and trust building across the complexity of a market democratic society. Moreover, a network approach in conjunction with PEPs and PEOs opens up a broader more nuanced way to assess investment in and change to society to achieve sustainable development and, concomitantly, open up dialogue, since democracy itself and various agents do not always exhibit common goals even if they do ultimately share a real interest in a viable environment. For Söderbaum this paradigm-tolerant, pluralistic, value-recognising and nuanced approach is quite different than the current dominant neoclassical approach – with its calculative universal economic agent, its suppression of value-orientations, its overwhelming focus on monetary values, its mechanistic-technocratic policy influence and its undemocratic implications for decision-making. He concludes:

> 'I believe that this "monetary reductionism" and monopoly of neoclassical economics in education and research more generally, is among the factors behind the present climate crisis and other failures in governance. In any case I contend that it is time to open the door for institutional economics and other heterodox schools of thought in economics [… and] "Democracy" is seldom discussed in mainstream economics textbooks […] I believe that there are many reasons for us as economists to bring in democracy as an essential element of our analysis' (Söderbaum, 2021).

Arising Issues and Elaborations

Pluralism is a basic commitment of much of non-mainstream economics and is often used to differentiate it from an 'orthodoxy' within the mainstream – since orthodoxy has quite different implications than a mere mainstream (see Fullbrook, 2008; Davis and Morgan, 2019). As such, Söderbaum's recent paper and his previous work sits comfortably with a whole array of similar works that follow a direction of travel i.e. critique of paradigm dominance; or at least, since not everyone is comfortable with the Kuhnian term and its implications, dominance of a single and highly disputable methodological-theoretical perspective at the heart of mainstream economics (e.g. Lawson, 2015; 2003; 1997; Dow, 2012; 1996). Söderbaum's version of this critique is, of course, informed by his institutional ecological economics and this

adds a significant additional dimension to his work. On the one hand, it places an important and otherwise under-appreciated perspective within the purview of economics. On the other, given the claims made by ecological economists for the ineluctability of that perspective, it raises critical questions for how ecological economics relates to the pluralism it is intended to contribute to. Any other school of thought is in effect required to establish it is compatible with the fundamental claims of ecological economics in so far as ecological economics binds the social world to the natural world (awkward though that term is). Ecological economics highlights the need for economies as subsystems to stay within the boundaries of the Earth System in which economy is embedded. Whilst there may be many considerations that influence deliberation regarding what kind of ecosystems we are prepared to live within, there is also the limit of liveable ecosystems and climate (and it is existential problems at this extreme that currently dominate in a climate emergency). What this suggests, and I by no means want to imply Söderbaum is unaware of this, is that there are basic issues regarding how pluralism *coheres* and how different theory and positions in economics and beyond economics are judged in relation to this. This is important in at least two fundamental ways.

First, Söderbaum sets out to modify economics to make it more constructive in its contribution to democratic deliberation in a market democracy. One aspect of this is to energise PEPs and PEOs to make better decisions. However, and again I by no means wish to imply Söderbaum is unaware of this (the point addresses the general reader), this invokes a fundamental dividing line in the political economy of ecological economics. To what degree can one be confident that PEPs and PEOs are able to recognise and overcome the limits of and problems created by the purposes, specific interests and incentives and motives of their positions, in so far as they are located in an economic *system* and whilst that system continues to exist? An economic system has characteristic features given to its parts by virtue of the powers and potentials of those parts, deriving from the organisation of those parts and has observable tendencies based on the mechanisms that are intrinsic to the overall organisation of the parts within that system.

Clearly, Söderbaum is not wrong to suggest that a more nuanced approach to the diversity within and across interests and actions for decision-making is valuable (no organisation is 'monolithic'). But as reference to neoliberalism suggests, one does not need to be a Marxist to recognise that a market democracy can also be designated as a capital accumulation system, otherwise known generically as capitalism. One does not need to be a Marxist to note that such a system involves the existence of corporations, the need to earn wages in existent employment types, pressure to consume both for identity purposes and to maintain aggregate demand, in turn, energising a credit dimension to the economy within a broader set of financial services as well as a development model built around the spread to new places and people of globalised industrial-consumption economies connected by long supply chains. One does not need to be a Marxist to recognise this is a *growth* system – in GDP terms and in material and energy use.

Of course, we (some of us) do in fact live, in the global North, in market democracies and so it is not just valid it is imperative that we recognise the need for democratic deliberation regarding possible solutions to climate emergency and ecological breakdown – in so far as we have power to effect change.[8] But there is surely an additional issue (and hence political economy dividing line) regarding the compatibility between systemic tendencies and any likely solution to the climate and ecological problems inhering in that system. Depending

[8] And I am not implying that deliberation is restricted to the global North, merely that the market democracies of the global North are deliberative locations (arguably one's with greater responsibility for the problems we currently experience even if they are not the only places where agency exists or markets etc.).

on where one sits on this issue determines whether one extends the idea of democratic deliberation from within market democracy to transformation of its underpinning system i.e. solutions that require some roles and powers not to exist in order to address the problem of systemic features and tendencies. If one takes this position then the political economy argument for democracy is more radical in its implications – will 'we' decide to follow this radical option is an open question, but it is not a neutral question, even if it depends on or is facilitated by, pluralism, since at the extreme (and this seems to be where we are now) it is determined by what the planet will bear not by what we alone prefer; though this is in the end an anthropocentric point, even if it is a claim that there is an objective-evidential issue, since the planet will not end if we become part of a latest mass extinction event.[9]

In any case, the point surely bears on the adequacy issue for signs of policy leading to 'embryonic transformation' we noted in the introduction. And this brings us to the second fundamental way one might consider how pluralism *coheres* and how different theory and positions in economics and beyond economics are judged in relation to this. What status are we to give to different theories etc. within economics as part of pluralism and how are we to teach students about these different theories etc? There is something of an unavoidable tension here for pluralism, but not one that undermines the case for pluralism. As previously intimated the case for pluralism is typically multiple: theory is limited and theory is fallible so it is not definite any given theory is entirely 'wrong', it may provide some insight under some description of the world; there can be several such theories none of which is entirely wrong and all of which offer some insight into some or all aspects of that world; the social world is 'real', yet is also constructed in a way that responds to our belief systems, purposes and actions and these can be variable, so theory is a way to test out different groups of values that underpin these to some purpose we can agree upon and make real through social design and implementable policy; given that several theories can offer insight into how things are and different theories can offer insight into how things can or could be, pluralism is a necessary feature of any social science discipline including economics and this has value both from a teaching point of view and a learning point of view – students ought to be left to make up their own minds and this, in turn, has a broader impact on the thinking of students as participatory citizens (it ideally helps make them more considered, critical and engaged participants).

However, the complicating feature here is that adequate teaching is not just plural in the sense of recognised diversity. Theory is not just diverse it has degrees of justification based on its assumptions, claims, omissions, and evidence, affecting its plausibility, persuasiveness, relevance and potential to be both effective on its own terms and affecting whether it is harmful when considered beyond those terms. So there is a question regarding how one conveys theory, which students are making their minds up about. This is a task fraught with dilemmas and complication and particularly so in the context of climate emergency and ecological breakdown. What is it *responsible* to teach and how would one teach it in a time of climate emergency and ecological breakdown? Again, and to labour the point, I am not suggesting Söderbaum is unaware of this – curricula and pedagogy are things he has thought about and written about for decades. I am suggesting that the reader ought to consider the further complications that pluralism must contend with.

For example, if economics is also ideology and education affects deliberation then the dominance of neoclassical economics has both served functions and had effects. This, of course, is intrinsic to critique of Cost Benefit Analysis and to Söderbaum's comments (in the

[9] For range of positions see, for example, Daly (2015, 1997, 1974), Hickel and Kallis (2020), Kallis et al. (2020), Hickel (2020), Kallis (2109), Fullbrook and Morgan (2019), Parrique et al (2019). For discussion see Daly and Morgan (2019), Nelson and Morgan (2020) and Keen and Morgan (2021), Morgan (2020b).

paper and in previous work) regarding the meaning of sustainable development (seeking to move it beyond oxymoron) and the problems of the 17 UN SDGs. But what this suggests is that the shift to pluralism contextualises the role and failure of neoclassical economics and this is different than teaching neoclassical economics as merely *one* theory amongst many. It is intrinsic to Söderbaum's advocacy that pluralism is a response to the lack of pluralism in the neoclassical framework, that neoclassical economics has either ignored or marginalised ecological issues (mainstream economics tends to assume that resource use, damage and cost and pricing effects will lead to investment and substitution, where induced technological responses will solve most problems, and any additional areas of failure can be delegated to a sub-discipline of environmental economics),[10] and that it has had consequences because of its influence on public understanding and on policy – and if one puts this together with the panoply of policy that has been developed over previous decades, the specific claims made by prominent economists (e.g. concerning optimal warming, discount rates, marginal losses of future GDP as economies grow without real limits)[11] and the cumulative evidence on emissions, species extinctions, resource overuse etc. then one can reasonably suggest neoclassical economics has consistently understated the cumulative problems of our system of economic activity from a climate and ecological point of view and has consistently failed to adequately address those cumulative problems. It has, as such, been a source of complacency and delay (albeit not the only one e.g. Newell, 2021; Ford and Newell, 2021; Lamb et al., 2020; Newell and Taylor, 2020; Stevenson, 2020; Oreskes and Conway, 2010; Lakoff, 2010).

Presenting students with a contextualised account of neoclassical economics, therefore, is to present them with a positioned account of a position and this leads to a further dividing line in ecological economics that one ought to be aware of. To what degree does one teach neoclassical economics as a limited technical-theory toolkit, which can be augmented or completed by ecological economics insight and to what degree does one place it in a political economy context that focuses on its ideological problems i.e. its power in the world in relation to its problematic features? One can, of course, expose students to neoclassical economics and suggest both of these possibilities, inviting them to make up their own minds, but the issue is one that ecological economists themselves divide over and this too has significance for the way we think about 'embryonic transformation'. Should neoclassical economics be taught as a *learning* exercise or used as a cautionary tale of what we need to *unlearn* in order to solve our climate emergency and ecological crisis? Clearly, there is a great deal more to say here and Söderbaum's books provide one source which bears reading. There are, of course, many others across a range of views (e.g. Spash, 2017). However, the more urgent one considers our current situation then the more the emphasis seems to shift to unlearning. In any case, I find myself in agreement that non-mainstream economics – heterodoxy etc. – seems to be more conducive to pluralism and thus to the prospect of coherent ways forward and it seems worthwhile adding a few additional comments here regarding how economics is taught and what is taught.

How Economics is Taught

As noted, neoclassical theory and a related methodology (or if one prefers a core mainstream; Morgan 2016b; 2015b) has comprised a dominant paradigm. Moreover, that

[10] For example, O'Neill (2007), Gills and Morgan (2020a, 2020b, 2000c).
[11] For example Nordhaus (1991, 1994) and for critique of IAMs and various associated methods – DICE etc. (see Keen 2020; Asefi-Najafabady et al., 2020; Dale, 2018; Hickel, 2018; Spash, 2002, pp. 153-183).

paradigm has not just been dominant it has exhibited features that tend to render it exclusionary, albeit this is typically a process of tacit selection and marginalisation of alternatives: it works around a core of concepts and operations that are typically taken as unquestioned points of departure and conflates science with quantification and modelling based on specific mathematical techniques (formal proofs of specific concepts, use of analytical statistics to test datasets in accordance with variables of interest etc.). The combination has enabled it to be universally applicable, flexible and diverse (in so far as diversity is limited by use of methods and degrees of departure from the most stringent versions of its concepts) and has ultimately been either non-falsifiable or able to insulate itself from any failures in a given empirical case. As such, a core mainstream has arrogated credentials as the most applicable, wide-ranging and successful social science, despite often being founded on distorting/impossible unrealistic assumptions, despite in some cases stating the obvious, banal or inane, despite that tests and discussion of technical merits of methods are often substituted for explanation, despite that tests at different times in different places can establish different direction and strengths of relations between variables within concepts whilst the intention is usually to establish only one, and despite that its focus on technical aspects internal to models as measurements often works to obscure or distract from the importance of real world cumulative tendencies.

Anyone familiar with economics will recognise the above features and will also be familiar with the way teaching and researching economics built around these features has gradually socialised economists to be less reflective regarding what it is that they do, which in turn helps to reinforce the consensus position (a situation of: *this is what science looks like, economics is a unique social science because it deals with data rich aspects of social activity*…). An underlying unity of the type described tends to select students for mathematical aptitude and tends to encourage translating the world into basic concepts and techniques that are then translated through the mathematics and with this comes a restrictive logic built around the basic assumptions and methods. Furthermore, the 'thinking like an economist' that this encourages is paralleled by a didactic approach to teaching – since the way of thinking can be quite alien and the main focus is grasping concepts through mathematical expression and this is conducive to approaches to teaching built around demonstration and confirmation (which in turn tends to restrict critique to discussion of the technical merits of variations on similar work). Whilst this approach has political economy implications it also tends to encourage economists to think of their science as non-political – an objective set of methods to which different predicates can be applied to explore social engineering potentials – more market, more state, more wages, more profits etc., etc. and yet it has tendencies to bias based on the intrinsic values that optimisation and efficiency in relation to large numbers (which becomes a stylised idea of competition) inculcate.

Critique of all of the above is, of course, not new. Heterodox economists, philosophers of economics and historians of economic thought, as well as sociologists have provided numerous descriptions and critiques of a core mainstream sociology of knowledge.[12] And the global financial crisis provoked renewed critique from both the mainstream and non-mainstream. The Institute for New Economic Thinking (INET) was formed, the Association for Heterodox Economics (AHE) and various other organisations called for curriculum reform, *Rethinking Economics* and *Reteaching Economics* were organised, Edward Fullbrook and others built on the success of the *Real-World Economics Review* to form the World Economics Association, which sponsors various teaching initiatives and the Curriculum Open-

[12] See, for example, Fourcade (2009, 2006); Fourcade and Healy (2007), Fourcade et al. (2015), Earle et al. (2017), Milonakis and Fine (2009), Davis and Morgan (2019), Syll and Morgan (2019) and Lawson and Morgan (2021).

access Resource in Economics (CORE) project was set up (with INET support) to develop new teaching resources with the aim of overcoming some of the key defects of standard economics textbooks (lack of real world focus, lack of attention to history of economic thought and to history of real economies, lack of pluralism, limits to critical thinking – since no one thinks of themselves as uncritical in the positive sense of that term, no more than they think of themselves as unintelligent, they are rather shaped in how they conceive of the process, etc.).

However, whilst curriculum reform has received considerable attention, pedagogy has received rather less – there has been general agreement that students ought to be encouraged to be more reflective and critical, and to appreciate more diverse sets of ideas and evidence, but relatively little consideration of how to achieve this through principles attached to teaching techniques (and as Andrew Mearman and others have often pointed out, little attention to what the purpose of education is supposed to be – what should be the balance between technical skill-based education for employment purposes, broad-based understanding to socialise well-informed and perhaps conformist citizens of the state, and more critical approaches that create possible adversarial agents of social change…).[13] As Söderbaum's early and recent work makes clear though, this 'how' (and to what end) is of great importance in educating students to engage in democratic deliberation. Arguably, pluralist approaches to economics and heterodoxy within pluralism, are more sensitive to pedagogical nuance.[14] For example, in 2014 I was invited by the editor of the *Royal Economics Society Newsletter* to respond to the CORE initiative on behalf of the AHE (of which I was then coordinator). In that response and in accordance with an ethos of 'giving students something to think about rather than telling them what to think', I suggested:

1. 'A boundary should be maintained between one's own position and what is conveyed to students regarding the existence of positions. To do otherwise is to conflate the end product of one's own judgment with teaching the process of judgement. The latter should always be the goal. There is no single way to achieve this but:
2. A teaching strategy or the use of material should not become an invitation to confirm. An invitation to confirm is not an earned agreement, it may be mere channelling for concordance. This principle applies also to technical material, since one should not confuse confirming a student has grasped a proof or a technique with an understanding of its place.
3. The context in which a body of substantive theory is presented is as important as the content.
4. It is as important to build space into the curriculum, as it is to build content into courses. This should not be conflated with simply timetabling in self-study based on a reading list. Genuine space is designed rather than simply bolted on as an additional period in which students are required to familiarise themselves with material. Genuine space builds in a capacity for considered responses to the material that one intended to convey, and as a corollary provides a place for creative responses to that material and for further

[13] See, for example, Guizzo et al (2019), Mearman et al (2018a, 2018b), AHE (2014). For more general issues of neoliberal education see Giroux (2014) and Zuidhof (2014). In a UK context institutional context see: Office for Students (2018) 'Measures of Our Success.' Office for Students. https://www.officeforstudents.org.uk/about/measures-of-our-success/
Advance HEA (2020) 'Equality in Higher Education Statistical Report 2020.' Advance HEA. https://www.advance-he.ac.uk/knowledge-hub/equality-higher-education-statistical-report-2020

[14] See for example, Decker et al. (20019), Jo et al. (2018), Lee and Cronin (2016), Madi and Reardon (2014).

> exploration of the arising significance of that material, perhaps because of current events. It militates against any time-pressured academic feeling compelled to respond to a potentially relevant economic question based on genuine curiosity with the dispiriting reply "that's not on the curriculum". Such space should also allow for the response, "I don't know but maybe we can consider the problem or find out". The existence of space in the curriculum distributes responsibility for learning. It also reinforces a learning disposition in students because it actively demonstrates to them that their opinion matters, that their opinion can be developed, and that the study of economics can always be turned to matters of relevance to the economy' (Morgan, 2014, pp. 17-18)

And:

> 'The organic outcome of implementing these principles ought to be engaged students who are encouraged and supported in developing a range of skills, from the assimilation of information to directed critical analysis of theory and evidence and then imaginative, creative responses to that theory and evidence. Such students are disposed to be collaborative problem solvers for whom objectivity is a demonstrated value [in the sense of open-mindedness].
>
> Of course, setting out pedagogic principles in this way typically invites accusations of condescension. No academic would claim to be anything other than committed to being a good and then better educator and no academic would claim anything other than this required also a focus on developing student skills based on teaching strategies. What I am inviting you to consider is the logic of these principles and the commitment. If drawing attention to them can invite accusations of condescension it is because they are in some sense uncontroversial. But this also means that open-ended contextualised teaching necessarily embraces pluralism in order to achieve its goals. Economics is a social science or study of an aspect of society, and so as a matter of inquiry into the economy requires one to range across history, philosophy and policy/politics. It would be pedagogically irresponsible in a social science to not invite students to ask what theory is and what theory is for, to not also invite them to consider the way responses to matters of theory, including the different motivating questions one can ask or goals one sets, can profoundly affect inquiry and policy. In so doing one also reveals economics to always be re- describable as political economy, not least because economics concerns competing descriptions, explanations, perspectives and visions of an economy and what it is for' (Morgan, 2014, p. 18).

Clearly, the dilemma regarding how to position neoclassical economics for teaching purposes we discussed in the previous section – as learning or unlearning – invites some degree of tension in terms of these principles and considerations. There are basic decisions to make in terms of # 3 and with a view to how students reflect on 'what theory is and what theory is for'. However, these dilemmas are not resolved if ignored, they are simply suppressed and whilst that is a problem at any time (in terms of the ethics of education) it is a particularly severe one if the issue is climate emergency (see Røpke, 2020; Reardon et al., 2018; Komlos, 2019). It remains the case, however, that pluralism seems to offer an appropriate background to any 'earned agreement' which might also encourage Söderbaum's vision of engaged and deliberative social/political/economic agents – though clearly there are different positions on

where the ethics of climate and ecological awareness and activism leads (e.g. Spash, 2020b; 2018).

What Economics Teaches

As the 2019 UNEP ten year assessment of emissions gap reports quoted in the introduction highlights, over the decade or so since the last major set of events that placed pressure on mainstream economics (the GFC), climate and ecological problems have only worsened and we now find ourselves in a declared climate emergency. Civil society movements such as Extinction Rebellion and Stay Grounded have sprung up and existing NGOs such as Greenpeace have become more prominent. Yet mainstream economics remains more of an impediment than an adequate source of public understanding and policy. Curriculum reform remains as important now as it was at the time of the GFC. In 2014/2015 the curriculum guidelines for UK higher education – the Quality Assurance Agency (QAA) approved subject benchmarks – were revised and there was a concerted effort to influence these (with limited success) based on a more pluralist approach to the curriculum. At that time I suggested a set of propositions and these seem as relevant today as they did then. In Söderbaum's terms they might perhaps be taken as a positional claim from a 'PEP' on behalf of a given 'PEO' and in some ways parallel his suggested definition of economics as 'the management of (limited) multidimensional resources in a democratic society'. I again quote at length – since I cannot express these propositions more concisely than I did in the paper from 2015:

1. 'Economics is the study of social provisioning or the different ways in which psychological, social and material well-being are and can be achieved through an economy. An economy is a historical and dynamic entity and its construction necessarily involves institutions and an emergent political framework that fosters particular trajectories for that economy. An economy is embedded in an ecology and there are material limits to development that cannot be ignored and are central to the continued achievement of well-being. Deliberation is fundamental to informed decision making at a micro and macro level and so economics is also an ethical science. Economics is integral to political processes and so has implications for policy and for how citizens live. It is always also political economy.
2. In so far as economics is the study of the social provisioning process, its insights are based on different sets of theoretical commitments or emphases. There are then many different ways to approach an economic problem and many different ways to construct theory and pursue an economic investigation. Economics is therefore necessarily pluralistic. Historically it encompasses different schools of thought that consider economic problems from different points of view based on different foci, concerns and ultimate aims. Since economics is deliberative and economies can qualitatively change, then there is also an ongoing need to consider new kinds of theorisation to consider old problems in new ways, and new problems based on new insights. Economics is contested but this is not simply a data issue; it is also an issue of the consequences of the dynamics of different approaches to social provisioning. Pluralism is ultimately a commitment based on the recognized value for the vitality of the discipline of constructive engagement with different approaches to an economic problem. It is rooted in the complexity, contingency and malleability of social reality.

3. Social reality is an integrated whole and economics is one way of demarcating an aspect of that whole. Its insights ought then to cohere with those of other social sciences, and productive interchange between the disciplines is an important way each can both inform and temper the claims of the others. It is therefore important that economics considers the theories, critiques and methods of other disciplines rather than primarily transpose its modes of analysis onto the subjects of other disciplines. This is part of what it means to be effective in studying economic phenomena in their historical, political, social, institutional and international contexts.
4. A successful economics education produces well-informed, responsible and critically aware citizens able to contribute more effectively to deliberation regarding issues of social provisioning. It also produces more productive economic participants and effective economic analysts.
5. Economics is in the broad sense a realist science. It pioritises realism and relevance over precision. It recognizes that there are many methods that may provide insights into an economic problem. It recognizes that there are limits to the use of any given method. It recognizes that an effective economics education develops the ability of an economist to understand the limits and potentials of different methods and different ways of theorising. In so doing, it recognizes that the ability to construct theory, and evaluate and use methods, requires a framing context of critical awareness. That awareness necessarily requires all students to be versed in the history of economic thought and the progress of economic history. It is also enhanced by the reflexive skills provided by the philosophy of economics, including, for example, social ontology. Without these, model building, the use of given methods, and of quantitative and qualitative data can all too readily be misused' (Morgan, 2015a, pp. 535-536).

These propositions are, of course, contingent and contestable and some of them involve ongoing disputes that represent open issues for economics (e.g. philosophical issues regarding the adequacy of varieties of realist social ontology and different types of social construction, issues of method-use informed by methodology in relation to use of qualitative and quantitative techniques and the status of models). Moreover, the phrasing 'more productive economic participants' is one that requires particular consideration when combined with ecological economics in virtue of # 1. and this has become more of a recognised concern in recent years as more non-mainstream economists take an interest in ecological economics and the problems of growths systems become more evident (see Spash, 2020a; 2020c; Dale, 2012). The issue of growth returns us to the problem of 'embryonic transformation' and we conclude with this.

Conclusion: Educating *for* the Future?

I suggested in the introduction to this commentary that there are fundamental issues to address in terms of unmaking futures we have set in motion and there are related issues in terms of unlearning theory that has informed policy and has affected public understanding of the nature of our economies, since this got us to where we are – i.e. a state of climate emergency. It should now be clearer what those issues are. Peter Söderbaum's work has over the years helped to improve awareness of the limits of economics as currently theorised and taught, and his most recent work brings to the fore basic issues of coherence that any

pluralist approach to economics must recognise and ultimately address. These are not mere esoteric or academic issues, given the role economics plays in the world – how we address these issues speaks directly to whether and what role economics might play in any putative 'embryonic transformation'. Yet the major dividing line remains one that has been central to ecological economics since its inception – the nature of a growth system. There is broad consensus amongst ecological economists that a growth system, targeting continual growth in GDP with associated growth in material and energy use, claims of decoupling and dematerialisation notwithstanding, is untenable and this needs to be clearer in any alternative to 'business as usual' (including progressive Green New Deal programmes).[15] But dividing lines still exist over whether our economic system can be made compatible with this shift away from growth, as we currently understand it, and whether democratic deliberation means choosing a radically different socio-economic system i.e., whether there is a survivable version of capitalism. Capitalism is an accumulation system, it innovates through incentive structures that are monetary even if it is possible to measure non-monetary aspects of an economy as a material system. Smaller, steady-state economies seem to strike at the core mechanisms of capitalism as we know it. Moreover, any dispassionate look at the mechanisms of industrial-consumption must recognise that the system as-is serves the needs of a relatively small proportion of the population of the planet and yet still exceeds the renewable resources of the planet. The future of 'development' cannot, therefore, be one of dissemination and emulation, whatever 'ideology' might offer in this regard. This, of course, indicates that no responsible economics can isolate itself from engagement with *global* issues of fairness, justice and distribution – values are, as Söderbaum suggests, of vital significance. Still, if economics is to provide an education for the future it must recognise that there may be objective sets of facts that inform viable values that ensure we have a future. The facts are clear, the values, beyond pluralism, are not yet settled though important initiatives have begun (see Newell, 2021).

References

AHE (Association for Heterodox Economics) (2014) 'Pluralism, heterodoxy and the prospects for a new economics curriculum.' Available at: http://www.hetecon.net/

Asefi-Najafabady, S. Villegas-Ortiz, L. and Morgan, J. (2020) 'The failure of Integrated Assessment Models as a response to 'climate emergency' and ecological breakdown: the Emperor has no clothes.' *Globalizations,* https://doi.org/10.1080/14747731.2020.1853958

Bradshaw, C. et al (2021). 'Underestimating the Challenges of Avoiding a Ghastly Future.' *Frontiers in Conservation Science* https://www.frontiersin.org/articles/10.3389/fcosc.2020.615419/full

Christensen, J. and Olhoff, A. (2019) *Lessons from a Decade of Emissions Gap Assessments.* Nairobi: UNEP.

Dale, G. (2018) 'The Nobel Prize in climate chaos.' *The Ecologist,* October 12th https://theecologist.org/2018/oct/12/nobel-prize-climate-chaos-romer-nordhaus-and-ipcc

Dale, G. (2012) 'The growth paradigm: A critique.' *International Socialism,* 134, pp. 55-88.

Daly, H. (2015) *Essays Against Growthism.* London: WEA/College Books.

Daly, H. (1997) 'Forum, Georgescu-Roegen vs. Solow/Stiglitz.' *Ecological Economics,* 22, pp. 261-266.

Daly, H. (1974) The economics of the steady-state. *American Economic Review,* 64(2), pp. 15-20.

[15] Is, for example, the transition to electric vehicles compatible with Paris goals (e.g. Morgan, 2020a; 2016a); how might one approach just transitions and aviation (Stay Grounded, 2021), is there a role for more disruptive global approaches to carbon taxes (Morgan and Patomäki, 2021) and what difference does inequality make (e.g. Morgan, 2017).

Daly, H. and Morgan, J. (2019) 'The importance of ecological economics: An interview with Herman Daly.' *Real-World Economics Review*, 90, pp. 137-154.
http://www.paecon.net/PAEReview/issue90/DalyMorgan90.pdf

Davis, J. and Morgan, J. (2019) "Heterodox economics and economic methodology: an interview with John Davis." *Real-World Economics Review*, 86, pp. 134-148
http://www.paecon.net/PAEReview/issue86/DavidMorgan86.pdf

Decker, S. Elsner, W. and Flechtner, S. (2019) *Principles and Pluralist Approaches in Teaching Economics.* London: Routledge.

Dow, S. C. (2012) *Foundations for New Economic Thinking.* Basingstoke: Palgrave Macmillan

Dow, S. C. (1996) *The Methodology of Macroeconomic Thought.* Cheltenham: Edward Elgar, second edition.

Earle, J. Moran, C. and Ward-Perkins, Z. (2017) *The Econocracy*. London: Penguin.

Ford, A. and Newell, P. (2021) 'Regime resistance and accommodation: Towards a neo-Gramscian perspective on energy transitions.' *Energy Research & Social Science*, 79,
https://doi.org/10.1016/j.erss.2021.102163

Fourcade, M. (2009) *Economists and Societies.* Princeton: Princeton University Press.

Fourcade, M. (2006) 'The construction of a global profession: The transnationalization of economics 1.' *American Journal of Sociology,* 112(1), pp. 145-194.

Fourcade, M. and Healy, K. (2007) 'Moral views of market society.' *Annual Review of Sociology,* 33, pp. 285-311.

Fourcade, M. Ollion, E. and Algan, Y. (2015) 'The superiority of economists.' *Journal of Economic Perspectives,* 29(1), pp. 89-114.

Fullbrook E. (ed) (2008) *Pluralist Economics* London: Zed

Fullbrook, E. and Morgan, J. (eds.) (2019). *Economics and the Ecosystem.* Bristol: World Economic Association Books.

Gills, B. K. and Morgan, J. (2020a) 'Global Climate Emergency: After COP24, climate science, urgency, and the threat to humanity.' *Globalizations,* 17(6), pp. 885-902.
https://doi.org/10.1080/14747731.2019.1669915

Gills, B. K. and Morgan, J. (2020b) 'Economics and Climate Emergency.' *Globalizations,*
https://doi.org/10.1080/14747731.2020.1841527

Gills, B. K. and Morgan, J. (2020c) 'Teaching climate complacency: mainstream economics textbooks and the need for transformation in economics education.' *Globalizations,*
https://doi.org/10.1080/14747731.2020.1808413

Giroux, H. (2014) *Neoliberalism's war on higher education.* Chicago: Haymarket Books.

Guizzo, D. Mearman, A. and Berger, S. 2019. '"*TAMA*" economics under siege in Brazil: the threats of curriculum governance reform.' *Review of International Political Economy*
https://doi.org/10.1080/09692290.2019.1670716

Hickel, J. (2020) 'What does degrowth mean? A few points of clarification.' *Globalizations,*
https://doi.org/10.1080/14747731.2020.1812222

Hickel, J. (2018) 'The Nobel prize for climate catastrophe.' *Foreign Policy,* December 6th.

Hickel, J. and Kallis, G. (2020) 'Is Green Growth Possible?' *New Political Economy,* 25(4), pp. 469-486.

IPCC (2018, October) *Global Warming of 1.5^{0}C: Summary for policymakers*. Geneva: Author

Jo, T. H., Chester, L. and D'ippolita, C. (eds.) (2018) *The Routledge Handbook of Heterodox Economics: Theorizing, Analyzing and Transforming Capitalism*. London: Routledge.

Kallis, G. (2019) *Limits: Why Malthus was wrong and why environmentalists should care.* Stanford: Standford University Press.

Kallis, G. Paulson, S. D'Alisa, G. and Demaria, F. (2020) *The Case For Degrowth.* Cambridge: Polity Press.

Keen, S. (2020) The appallingly bad Neoclassical Economics of climate change. *Globalizations*, https://doi.org/10.1080/14747731.2020.1807856

Keen, S. and Morgan, J. (2021) 'From finance to climate crisis: An interview with Steve Keen.' *Real-World Economics Review*, 95, pp. 130-147, http://www.paecon.net/PAEReview/issue95/KeenMorgan95.pdf.

Komlos, J. (2019) *Foundations of Real-World Economics.* London: Routledge.

Lakoff, G. (2010) 'Why it matters how we frame the environment.' *Environmental Communication* 4(1), pp. 70-81.

Lamb, W. Mattioli, G. Levi, S. Roberts, J. Capstick, S. Creutzig, F. Minx, J. Muller-Hansen, F. Culhane, T. and Steinberger, J. (2020). Discourses of climate delay. *Global Sustainability* 3, e17, pp. 1–5. https://doi.org/10.1017/sus.2020.13

Lawson, T. (2015) *The Nature and State of Modern Economics.* London: Routledge.

Lawson, T. (2003) *Reorienting Economics*. London: Routledge.

Lawson, T. (1997) *Economics and Reality*. London: Routledge.

Lawson, T. and Morgan, J. (2021) 'Cambridge social ontology, the philosophical critique of modern economics and social positioning theory: an interview with Tony Lawson, part 1.' *Journal of Critical Realism* 20(1): 72-97. https://doi.org/10.1080/14767430.2020.1846009

Lee, F. and Cronin, B. (eds.) (2016) *Handbook of Research Methods and Applications in Heterodox Economics.* Cheltenham: Edward Elgar. https://www.elgaronline.com/view/edcoll/9781782548454/9781782548454.00007.xml

Madi, M. and Reardon, J. (eds) (2014). *The Economics Curriculum.* London: WEA Books.

Mearman, A. Berger, S. and Guizzo, D. (2018a) 'Whither political economy? Evaluating the CORE project as a response to calls for change in economics teaching.' *Review of Political Economy,* 30 (2), pp. 241-259.

Mearman, A. Berger, S. and Guizzo, D. (2018b) 'Is UK economics teaching changing? Evaluating the new subject benchmark statement.' *Review of Social Economy,* 76 (3), pp. 377-396.

Milonakis, D. and Fine, B. (2009) *From Political Economy to Economics* London: Routledge

Morgan, J. (2020a) 'Electric Vehicles: The future we made and the problem of unmaking it.' *Cambridge Journal of Economics,* 44(4), pp. 953-977. https://doi.org/10.1093/cje/beaa022

Morgan, J. (2020b) "Degrowth: necessary, urgent and good for you." *Real-World Economics Review* 93, pp. 113-131. http://www.paecon.net/PAEReview/issue93/Morgan93.pdf

Morgan, J. (2017) 'Piketty and the growth dilemma revisited in the context of ecological economics.' *Ecological Economics*, 136, pp. 169-177. https://doi.org/10.1016/j.ecolecon.2017.02.024

Morgan, J. (2016a) 'Paris COP21: Power that speaks the truth?' *Globalizations*, 13(6), pp. 943–951. https://doi.org/10.1080/14747731.2016.11638663

Morgan, J. (ed.) (2016b) *What is Neoclassical Economics? Debating the origins, meaning and significance.* London: Routledge.

Morgan. J. (2015a) 'Is economics responding to critique? What do the UK QAA 2015 Subject Benchmarks for Economics indicate?' *Review of Political Economy,* 27(4), pp. 518-538. https://doi.org/10.1080/09538259.2015.1084774

Morgan, J. (2015b) 'What's in a name? Tony Lawson on Neoclassical Economics and Heterodox Economics.' *Cambridge Journal of Economics,* 39(3), pp. 843-865. https://doi.org/10.1093/cje/beu0441

Morgan, J. (2014) 'Necessary pluralism in the economics curriculum: the case for heterodoxy.' *Royal Economics Society Newsletter,* 167: 14-17.

Morgan, J. and Patomäki, H. (2021) 'Planetary good governance after the Paris Agreement: The case for a global greenhouse gas tax.' *Journal of Environmental Management,* https://doi.org/10.1016/j.jenvman.2021.1127553

Nelson, J. A. and Morgan, J. (2020) 'Ecological and feminist economics: An interview with Julie A. Nelson.' *Real-World Economics Review*, 91, pp. 146-153.
http://www.paecon.net/PAEReview/issue91/NelsonMorgan91.pdf

Newell, P. (2021) *Power Shift: The Global Political Economy of Energy Transitions.* Cambridge: Cambridge University Press.

Newell, P. and Taylor, O. (2020) 'Fiddling while the planet burns? COP 25 in perspective.' *Globalizations,* 17(4), pp. 580-592.

Nordhaus, W. (1991) 'To slow or not to slow: The economics of the greenhouse effect.' *The Economic Journal,* 101, pp. 920-937.

Nordhaus, W. (1994) 'Expert opinion on climatic change.' *American Scientist*, 82(1), p. 4551.

O'Neill, J. (2007) *Markets, Deliberation and Environment.* London: Routledge.

Oreskes and Conway (2010) *Merchants of Doubt.* New York: Bloomsbury.

Parrique, T. Barth, J. Briens, F. Kerschner, C. Kraus-Polk, A. Kuokkanen, A. and Spangenberg, J. H. (2019) *Decoupling debunked.* European Environmental Bureau. https://eeb.org/library/decoupling-debunked/.

Reardon, J. Madi, M. and Scot-Cato, M. (2018) *Introducing a New Economics.* London: Pluto Press.

Ripple, W. Wolf, C. Newsome, T. Barnard, P. Moomaw, W. (2021) 'The climate emergency: 2020 in review.' *Scientific American*, January 6th https://www.scientificamerican.com/article/the-climate-emergency-2020-in-review/

Ripple, W. Wolf, C. Newsome, T. Barnbard, P. Moomaw, W. and 11,258 signatories (2020) 'World Scientists' Warning of a Climate Emergency.' *BioScience,* 70(1), pp. 8-12.

Røpke, I. (2020) 'Econ 101—In need of a sustainability transition.' *Ecological Economics,* 169, article 106515.

Söderbaum, P. (2021) 'The challenge of sustainable development: from technocracy to democracy-oriented economics.' *Economic Thought,*
'The Challenge of Sustainable Development: From technocracy to democracy-oriented political economics'.

Söderbaum, P. (2018 [2016]) *Economics, ideological orientation and democracy for sustainable development.* London: WEA Books.

Söderbaum, P. (2008) *Understanding Sustainability Economics: Towards Pluralism in Economics.* New York: Earthscan.

Söderbaum, P. (2000) *Ecological Economics.* New York: Earthscan.

Spash, C. (2020a) 'The economy as if people mattered: Revisiting critiques of economic growth in a time of crisis.' *Globalizations,* https://doi.org/10.1080/14747731.2020.1761612

Spash, C. (2020b) 'A tale of three paradigms: Realising the revolutionary potential of ecological economics.' *Ecological Economics,* 169, article 106518.
https://doi.org/10.1016/j.ecolecon.2019.106518

Spash, C. (2020c) 'Apologists for Growth: Passive Revolutionaries in a Passive Revolution.' *Globalizations,* https://doi.org/10.1080/14747731.2020.1824864.

Spash, C. (2018) 'Facing the truth or living a lie: Conformity, radicalism and activism.' *Environmental Values*, 27, pp. 215–222.

Spash, C. (ed.) (2017) *Routledge Handbook of Ecological Economics: Nature and Society.* New York: Routledge.

Spash, C. (2008) 'The economics of avoiding action on climate change.' *Adbusters # 75* 16(1), pp. 4-5.

Spash, C. (2002) *Greenhouse Economics* London: Routledge

Stay Grounded (2021) 'A Rapid and Just Transition of Aviation.' https://stay-grounded.org/just-transition/

Steffen, W., Rockström, J., Richardson, K., Lenton, T. M., Folke, C., Liverman, D., Schellnhuber, H. J. (2018) 'Trajectories of the Earth System in the Anthropocene.' *Proceedings of the National Academy of Sciences of the USA*, 115, pp. 8252–8259.

Steffen, W. and Morgan, J. (2021) 'From the Paris Agreement to the Anthropocene and Planetary Boundaries Framework: An interview with Will Steffen.' *Globalizations*, https://doi.org/10.1080/14747731.2021.1940070

Stevenson, H. (2020) 'Reforming global climate governance in an age of bullshit.' *Globalizations*, https://doi.org/10.1080/14747731.2020.1774315.

Syll, L. P. and Morgan, J. (2019) "Realism and critique in economics: An interview with Lars P. Syll." *Real-World Economics Review*, 88, pp. 60-75, http://www.paecon.net/PAEReview/issue87/SyllMorgan88.pdf

UNEP (2020). *Emissions Gap Report.* (eleventh) Nairobi: Author.

Wildauer, R. Leitch, S. and Kapeller, J. (2020) *How to Boost the European Green New Deal's Scale and Ambition*. Brussels: Foundation for European Progressive Studies.

Zuidhof, P. (2014) 'Thinking like an economist: The neoliberal politics of the economics textbook.' *Review of Social Economy*, 72 (2), pp. 157-185.

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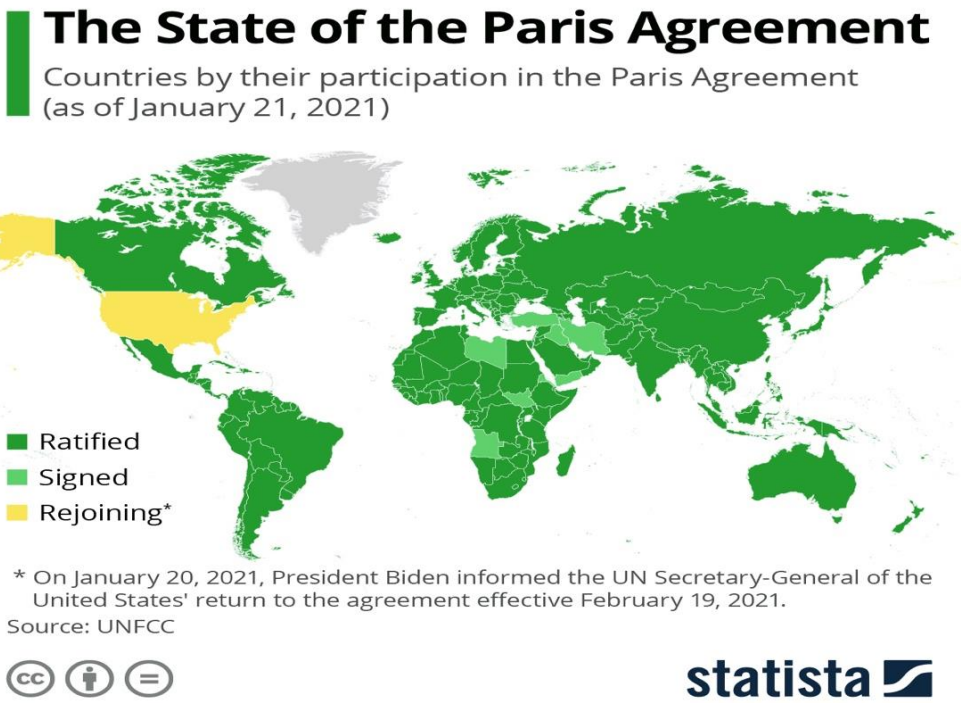
Appendix A: Countries committed to the Paris Agreement



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