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Citation:

Gills, BK and Morgan, J (2021) Postscript, an end to the war on nature: COP in or COP out? Globalizations. pp. 1-12. ISSN 1474-7731 DOI: <https://doi.org/10.1080/14747731.2021.1973273>

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Editorial Postscript

An End to the War on Nature: COP in or COP out?

Barry K. Gills and Jamie Morgan¹

Abstract: In this editorial postscript we return to a primary theme of this special issue on Economics and Climate Emergency. We elaborate on some aspects of, and reasons why we need, urgent and radical transformative change. We briefly update the trends affecting climate change and ecological breakdown, assess the need for an end to the ‘war on nature’, which resists a dichotomy between our species and nature and make some comment on the COP process and ways forward which resist ‘transformismo’, while embracing the need for just transitions, degrowth and practices rooted in such concepts as ‘transversalism’.

Key words: Conference of the Parties; climate emergency; ecological breakdown; degrowth; transversalism.

‘On this planet a great number of civilizations have perished in blood and horror. Naturally, one must wish for the planet that one day it will experience a civilization that has abandoned blood and horror; in fact... I am inclined to assume that our planet is waiting for this. But it is terribly doubtful whether we can bring such a present to its hundred or four-hundred-millionth birthday party. And if we don’t, the planet will finally punish us, it’s unthoughtful well-wishers, by presenting us with the Last Judgment.’ Walter Benjamin.

‘Prophecies often come true as anti-climaxes, the predictions themselves having set the stage too well – serving to acculturate as well as alarm, introducing first and then effectively normalizing the possibility of events that would have seemed, not so long ago, unthinkable.’ David Wallace-Wells.

Introduction

Given the extended period over which the essays for this Special Issue on Economics and Climate Emergency were written and first published online, we thought it appropriate to add a final editorial commentary, to review the significance of recent climate science and renew our

¹ The authors would like to confirm that they are joint and equal co-authors of this article.

call for urgent radical transformative action (Gills, 2020; Gills and Hosseini, 2021). We wish to begin, however, by saying something about our intentions when we decided to organise this project. Our main aim was to critique the dominant mainstream Economics paradigm (often referred to somewhat loosely by the term neoclassical and typically associated with neoliberalism) and to expose its function as a causal driver of the global climate emergency and ecological crisis. Thus, for example, we invited Steve Keen and a number of other economists to contribute critiques of mainstream economics. In our view it is strategically vital to ‘overturn’ the dominant paradigm in the field of Economics, and to create and propagate a radically different paradigm and a new standard curriculum for the teaching of the field. This new paradigm should reflect whole systems thinking, Earth system science, and abandon false dichotomies including the supposed separation of humanity from nature (Biermann, 2021), and politics from economics, while moving to a postgrowth and post GDP measured understanding of what constitutes ‘wealth creation’ and human well-being and future peace and security.

The essays written for this special issue were composed and published online over a two year period. During this short period we have witnessed an intensification and acceleration of the conjoint crises of global climate change and ecological breakdown (or ‘biosphere degradation’). This entails more frequent and intense ‘extreme weather events’ around the globe; widespread fires and deforestation; increased emissions of methane; and increased polar ice melting, including in Greenland and West Antarctica. Warnings based on the science have grown evermore severe. The use of the term ‘collapse’ to refer to potential societal or civilizational failures in the coming decades has now become mainstream, while the official responses in terms of real policy commitments and actual greenhouse gas emissions cuts remain woefully inadequate to prevent potentially catastrophic scenarios from becoming future reality.¹ Myriad actors have at least rhetorically taken on board the need to plan to decarbonise, or to achieve ‘net zero’ status but much of this lacks concrete plans, clear implementable policy or immediate consequences (as well as a realistic assessment of the nature of ‘net’).

Average global temperature continues to follow a general trend increase, as do the cumulative parts per million of CO₂ in the atmosphere on a global basis. In response, mass movements of protest and mobilisation have rapidly grown across the world, demanding radical change to the status quo and emergency action on the climate crisis. It has tended to be the poorest and most vulnerable people in the world who already suffer first and most severely from the global crisis, revealing deep inequalities and structural injustices in the existing global order. The failure of the existing state governance systems and global institutions to adequately address the climate emergency indicates the urgent historical need for radical transformation, or what is now widely referred to as ‘system change’.

Moreover, over the short period since we began this project, the global Covid pandemic has struck, numerous economies have floundered, poverty, debt and inequality have increased, and great swathes of populations have suffered increased vulnerabilities and disruptions. The triple crisis of capital, climate, and Covid, and their intimate interrelationship, is now apparent to everyone. The existing global system, and indeed our present form of civilisation, is entering a period of ‘implosion’ (Gills, 2020). This too follows a trend, according to work by Earth system scientists over the last two decade or so 3 then 4 and now likely 6 of 9 ‘planetary boundaries’ have been transgressed (Steffen and Morgan, 2021). This risks a host of feedback amplification problems as well as transitions that are irreversible according to any reasonable timeline.

Amongst the recent scientific reports documenting the progress of the crisis, the eleventh UNEP emissions gap report was published, revealing yet another set of dire statistics for greenhouse gas emissions (UNEP, 2020). The situation is dire enough to cause great swathes of the scientific community to organise and the Alliance of World Scientists have reiterated the extreme risks and urgent imperative for action commensurate to the reality of

climate emergency (Ripple et al., 2021a, 2021b). The IPCC, meanwhile, collates and publishes material in cycles, culminating in a synthesis ‘Assessment Report’ (AR). The IPCC is currently in its 6th cycle, and the AR6 synthesis report is due 2022. However, the IPCC recently released a report from Working Group 1 (‘physical basis’) which provides detailed measurements of the actual extent of greenhouse gas emissions and unfolding global climate patterns (IPCC, 2021). This makes it very clear **that in all 5 of its scenarios**, within the next two decades global warming reaches or exceeds the 1.5⁰C goal of the Paris Agreement, regardless of how radically governments and corporations now cut greenhouse gas emissions, albeit the authors make every effort not to convey the impression that our situation is irredeemable.

In any case, according to the IPCC report, ‘low likelihood’ but potentially high impact or ‘extreme events’, including the possibility of ‘abrupt responses and tipping points of the climate system’ are now becoming more likely as global heating continues. This includes processes such as Antarctic ice sheet melt, forest dieback, and slowing of the Atlantic Meridional Overturning Circulation (AMOC) oceanic flow (the conveyor which brings warm waters north). Among the further consequences are continued trends of ocean acidification, and sea level rise, which will be ‘irreversible for centuries’. Humanity is currently on course for the IPCC ‘intermediate’ and ‘high’ emissions scenarios, which could produce warming of 2.7⁰C to 3.6⁰C by 2100 respectively.

We are thus heading towards the catastrophic end of previous anticipations of possible futures even though in recent years the key measure of ‘climate sensitivity’ (the rate of heating per doubling of CO₂) has narrowed for core scenarios; and it is worth noting that over the years the general direction of travel has been (eventually – given there have been debates regarding differences between immediately observable effects and long term consequences for the balance of modelling of climate change) towards worst cases based on the full array of interdependencies and effects on climate systems and the biosphere. This is mainly because explicable but otherwise uncertain effects are taking hold – creating a problem of known unknowns and surprise. As a recent paper in *Earth System Dynamics* notes, while various particular processes are ‘well-understood’ it remains unclear how ‘interdependencies’ will unfold and with what consequences, though ‘domino effects’ and tipping points can be at least conjectured within current computational constraints (Wunderling et al., 2021).² The anticipation is that these exacerbate adverse effects. In any case, some consequences are being observed *quicker* than expected, such as changes to temperature variation in the Antarctic, the fragmentation of ice shelves and the subsequent rate of loss of ice sheets from land to sea.

Still, according to the IPCC report the ‘good news’ is that, in the most ambitious low emissions scenario, with emissions cuts made to achieve ‘net zero’ and the removal of further CO₂ from the atmosphere (i.e., ‘negative emissions’), the global climate might eventually stabilise after 20 years, and heating fall back to 1.4⁰C by 2100. Depending on the category of measure at present, humanity emits around 40 billion tonnes of CO₂ per annum. Under the ‘very low’ emissions scenario from the IPCC (to achieve 1.4⁰C by 2100) that will need to fall to 5 tonnes per annum by 2050. As Ed Hawkins, one of the authors of the IPCC report states, ‘Every bit of warming matters. The consequences get worse and worse and worse as we get warmer and warmer and warmer. Every tonne of CO₂ matters.’³

The ‘good news’, furthermore, is tempered and this speaks to the need for the most urgent and radical of action. With assistance from members of Scientist Rebellion a leaked report has emerged from sources within the IPCC – Mitigation (Group III) (CTXT, 2021).⁴ This is the group responsible for analysis of how to reduce emissions and mitigate impacts. The final report will not be published until March 2022, that is, long after vital decisions have been made at the next ‘Conference of the Parties’ (COP). In that leaked report, the authors state that emissions must peak globally *before* 2025 and reach net zero between 2050 and 2075. Concomitantly, no new coal or gas fired plants should be built and existing ones should be

wound down before their normal time of decommissioning, growth in global consumption of energy and materials (which remains the main cause of increase of greenhouse gases) must be reduced, which requires a ‘massive transition in the consumption of materials around the world’ (CTXT, 2021). Significantly, they also note it is possible to address extreme poverty around the world without exacerbating the global heating crisis—given that ‘the largest emitters are the richest’ and the richest 10% emit ten times more than the poorest 10%.

The leaked report endorses what amounts to a degrowth strategy and suggest that ‘In scenarios that contemplate a reduction in energy demand, mitigation challenges are significantly reduced, with less dependence on CO₂ removal (CDR), less pressure on land and lower prices of carbon. These scenarios do not suppose a decrease in well-being, but rather a provision of better services.’ (cited in CTXT, 2021). Measures to be taken cited include both legislative acts and civil society mobilisation and protest.

There are in addition various other endorsements by scientists of what are essentially degrowth pathways. For example, a recent article in *Nature Communications*, advocates the benefits of planning a stabilisation or decrease in energy and materials use, in recognition that continued unbridled growth without damage to the planetary environment is impossible (Keyber, 2021).

And as we return to below, then there is ‘Glasgow’ and the (as many of its participants now suggest) critical moment of COP26... In terms of the planet taken as a whole there has been a gulf between the rhetoric and reality of the combined action of governments for decades. Gaming, denial, delay, and deferral in terms of actions commensurate to the problem have dominated. And so here we are in a situation where our species’ future well-being and perhaps even survival now rests, in part, upon the ability of governments to rise above particular interests and recognise that there can be no particular interests if we do not act in our collective interest. That means taking the necessary decisions to change course *immediately* and to rapidly accelerate the scope and speed of action across the planet. This, in turn, requires (however one thinks about the nature of historic responsibility, since the planet doesn’t care either way) greatest action from those who are currently in a position to make the majority of material difference – China, the USA, EU, Australia, Japan, Russia, Brasil... (e.g. Smith, 2020).

One thing seems certain, what ‘we’ i.e., the whole of humanity, do to respond to climate emergency and ecological breakdown during the present decade of the 2020s is absolutely pivotal. Our collective actions now seem likely to determine the future prospects of humanity for centuries to come. The radical urgency of now is present. An ‘age of adaptation’ looms, and an era of ‘politics of tipping points’ ensues (Lewis, 2021). As the recent IPCC report concludes, we urgently need transformational change, across myriad process and behaviours, at all levels from individual, to national, regional and global. We need to redefine and transform our way of life. Politics and policy in the coming decades will be compelled to debate and organise sweeping adaptations and mitigation, as the progress of the global climate crisis increasingly threatens our existing infrastructure, built environment, and food system with obsolescence (e.g. heat domes and melting power cables, extreme drought and flooding, widespread fires) In short, as global heating increases, our existing infrastructure, built environment, and agricultural and forestry systems will be rendered “unfit for purpose” and will become more prone to potentially calamitous system failures. We need to redesign our civilisation.

An end to the war on nature?

Industrial consumer capitalism has taken the form of an undeclared war on nature. If we look to adverse consequences for the planet on which we live this statement scarcely warrants defending today. Every new data point regarding rising tonnes of carbon in the atmosphere and

thinning top soils on the Earth, every report of yet another square meter of the planet brought under the sway of human habitation, modification or extraction, speaks to this undeclared war... And every new drought, forest fire and flood, every disappearing ice sheet, every oceanic algae bloom, every tangle of plastic, every poisoned river, every industrial fishing trawler, every species brought to extinction, lends credence to this undeclared war.

It does not require capitalism to be the only thing for this war to be real, it does not require other forms of socio-economic organization to be guiltless, it does not require an absence of countervailing initiatives in some places (clean air acts, taxes and targets for this or that problem, investment in and adoption of ‘green technologies’, changes to consumer behaviour etc.) for the existence of this war to be true in totality.⁵ Nor is capitalism a dirty word (even if it invites us to dirty the planet from pole to pole). It is simply the term for our dominant way of organising an economy and we need to be clear about what the consequences of this collective activity have been on a global basis (even if some countries, corporations, peoples and places are more responsible than others) since the industrial revolution and since the further ‘great acceleration’ of climate and ecological harms over the last half century (McNeill, 2001; Moore, 2015). Whatever one thinks of their various positions on issues such as how to value ‘natural capital’ and its implications for asset formation and exploitation, influential Earth system scientists such as Johan Rockström generally affirm that the root cause of our present climate and ecological crises is humanity’s ‘overexploitation’ of nature and that this involves a ‘mode of development’ that now has a planetary extent. Global extractivism has expanded immensely over the past several decades, placing extreme stress on essentially every ecosystem and region of the planetary web of life and we may face a ‘ghastly future’ (Bradshaw et al. 2021).⁶

One might say the evidence hides in plain sight, but ‘hides’ seems inappropriate now, whatever the metaphor was intended to convey. In any case, we cannot continue to be reckless of obvious consequences. What has become equally obvious is that this is not a ‘war’ our current form of social order can win. It has been said many times but bears repeating, socio-economies depend on flows of energy and materials, they are ‘metabolic’ and their processes are subject to thermodynamics (e.g. Spash and Guisan, 2021). Energy is neither created nor destroyed (the first law) but in use it is dissipated or disordered (the second law), which we call entropy and this is the direction of travel of the totality of systems, but it is a tendency that any individual system can offset by drawing on another. Hence, human systems create order by drawing in and using up energy sources in order to transform one thing into another, but at the expense of energy dissipation and waste into the greater environment. Until the industrial revolution this was, historic empires notwithstanding, mainly a localised, slow and relatively low impact set of effects. Today, however, it is an industrial and consumer system built around continual expansion, built around intensive and extensive growth, an accumulation system, measured according to exchange values in a circular flow of income. Within this industrial and then consumer system, technology and fossil fuel use led to a whole new order of energy exchange, resource use and waste creation. From this has emerged a series of industrial revolutions (chemical, electrical, digital etc.), beginning in some countries but with a globalising drive and from all of this has emerged the world as we know it: a place of marvels, but equally a system that has manifestly failed to learn the lesson that one cannot expand (the extraction and consumption of resources drawn from the web of life) without limit on a finite planet. To mix metaphors this is to cut off the branch on which we sit or hole the boat in which we float.

The overwhelming weight of evidence suggests that the global collective of economies cannot ‘decouple’ economic activity from energy and resource use sufficiently to allow that economic activity to continue at its current scale and intensity (which already far exceeds the regenerative capacity of the Earth) and that it cannot do so in a way that would facilitate

economic activity on the basis of *continual* global economic growth (Hickel and Kallis, 2020; Parrique et al., 2019). Decarbonisation is just one among many challenges and in the end no socio-economy can ‘dematerialise’ in any meaningful sense. How to address the problem ‘as is’ is already acute, as William Rees recently noted:

Many analysts ignore the sheer scale of the required transition. The IPCC emissions reduction schedule requires reductions of $\sim 7\%$ year assuming we began in 2021. In the absence of carbon capture and storage, this would mean substituting for 7% of fossil fuel use. Consider that in 2019 fossil fuels contributed 492.34 EJ (136,761.11 Twh) to global primary energy production (84%). Seven percent of this is 34.46 EJ or 9573.3 Twh. If we assume a conversion ratio of 2.47:1 for wind and solar (W&S) energy (i.e., 1 unit of wind/solar energy = 2.47 units of fossil energy when converted to electricity), we would need 3875.8 Twh of new W&S electricity in just the first year. However, the total amount of W&S electricity generated in 2019 was 2153.7 Twh (equivalent to $<4\%$ of supply). In short, to meet the IPCC Paris target (-7% emissions per year) we need to build 1.80 (3875.8/2153.7) times the entire multi-decade cumulative global stock of wind and solar installations in the first year alone. Repeat the process in subsequent years. This is impossible. In any event, building out a renewable energy infrastructure at this pace would itself blow emissions limits; and even if it could be done (coupled with 100% carbon capture) the world would still have an overshoot crisis. (Energy data from BP Statistical Review of World Energy 2020). (Rees, 2021: 105, fn 6)

The precision and technical details of Rees’s calculation are less important than the general point made. There is no victory over nature if our species insists on continual material growth, on treating the planet as a place of rapacious and relentless resource extraction and as a site for endless disposal of our waste products. Moreover, while the IPCC may be right to suggest we need a response equivalent to mobilisation for war, the very language of war speaks to a meaning frame which seeks to master the world rather than take our place in it as one species among many. Recognition of this does not require us to idealise nature according to some bucolic fantasy or fictive past, it does not require us to reify nature or dichotomise ‘man’ and ‘nature’ (we must frame our thinking differently, e.g. Biermann, 2021), but it does require us to accept that commodifying nature is not just metaphor, it is a material reality which is counterproductive to the survival and ultimate flourishing of our species.⁷ From this flows the ineluctable conclusion that civilization *must* change.

Rational accommodation to evidence is not surrender, but rather survival through cultural learning. As most of us know and as the news cycle increasingly informs us, governments have finally begun to acknowledge that we are in a climate emergency and that ecological breakdown is widespread. They have also started to acknowledge the broader significance of this. For example, the UK House of Commons Environmental Audit Committee recently stated:

To reverse the trend of biodiversity loss requires urgent transformative change. This cannot be achieved simply through using natural resources more efficiently. Total material consumption in developed economies needs to be reduced, nature needs to be accounted for in economic decision making and governments and businesses need to take pre-emptive and precautionary actions to avoid, mitigate and remedy the deterioration of nature. Alternatives to GDP urgently need to be adopted as more appropriate ways to measure economic success, appraise investment projects and identify sustainable development (UK Environmental Audit Committee, 2021).

This is a small step towards recognising the underlying causes of our current predicament and as the previous section suggested, such acknowledgements can now be found in many places. But they are very far from a coordinated global, timely and practical set of solutions to climate emergency and ecological breakdown. The recent IPCC *Global Warming of 1.5^oC* report (IPCC, 2018) has seemingly galvanised many powerful actors and the UN has organised the Climate Ambition Alliance to encourage countries to increase the ambition of their ‘nationally determined contributions’ under the Paris Agreement and has launched the ‘Race to Zero’ campaign to feed this through to cities, regions and businesses.⁸

Paris, of course, evokes the role of the United Nations Framework Convention on Climate Change (UNFCCC). The UNFCCC was established in 1992 and the Conference of the Parties (COP) process has been a key feature since 1995. As Will Steffen notes, the focus of the climate convention is insufficient to encompass all aspects of our current crises and yet the COP process is a vital component in any solution (Steffen and Morgan, 2021). As previously noted, at the time of writing, COP 26 hosted in Glasgow by the UK government (in partnership with Italy) was fast approaching and will quickly come and go. It is a cliché to say that these are ‘days of decision’ but the rhetoric of the COP process now reflects this cliché. The question is whether rhetoric will become reality (see Newell and Taylor, 2020). The UK Prime Minister, Boris Johnson, is no one’s idea of an eco-activist and his introduction to COP 26 highlights a basic tension:

As the world looks to recover from the impact of coronavirus on our lives, livelihoods and economies, we have the chance to build back better. Our Ten Point Plan will help deliver a green industrial revolution - by investing in clean energy, transport, nature and innovative technologies - creating hundreds of thousands of jobs in the process. Leading the world in tackling and adapting to climate change is a major economic opportunity for the UK, that will create new skilled jobs across the country as well as export opportunities for our firms. (UK Government, 2021).⁹

For wealthy countries and their governments, the climate emergency is an economic opportunity, one which invites responses according to the logic of an accumulation system energised by global competition between countries and through corporations and financial institutions. For poorer countries and their governments, this logic still applies, but climate emergency appears first more as economic threat than opportunity, since it seems to imply denial of the same basis of ‘development’ travelled by advanced capitalist countries. It is this fragmented sense of competitive concerns that must be disentangled if our species is to respond adequately to the crises it now confronts. As Andrew Sayer memorably puts it ‘The dream of ‘green growth’, with capitalism delivering sustainability, is like selling guns to promote peace’ (Sayer 2015: 341).

As we suggested in the previous section the case for smaller less impactful economies and transition to a ‘postgrowth’ world is gaining traction and there are numerous strands and contributions and continual development of argument and policy across an array of positions, such as social ecological economics and degrowth (e.g. Demaria et al., 2013; Kallis, 2018; Hickel, 2020b; Liegey and Nelson, 2020; Spash, 2020c).

‘Transversalism’ and ‘Deep Restoration’ rather than ‘trasformismo’

To conclude, the many essays in this special issue and the many others published in *Globalizations* (e.g. Spash and Hache, 2021), including the recent special issue titled ‘It’s About Time: Climate Change, Global Capital and Radical Existence’, (e.g. Jasanoff, 2021) and the work of a growing community of scholars and activists (e.g. Stay Grounded, 2021; Polluters

Out, 2020) speak to various aspects of the issues we have highlighted in this editorial postscript.¹⁰ As Peter Newell's work argues and his latest book *Power Shift* confirms, the change we need must distinguish transformation from 'trasformismo' (Newell, 2021). *Trasformismo* is a term drawn from Gramsci. It refers to co-option that undermines or subverts change (greenwashing and so on) and its typical companion term is 'passive revolution' or strategies that advocate gradual change but default to vested interests or power preserving strategies that continually fall short of what is needed by deferring significant change into some notional future. One does not need to be a Marxist in order to appreciate how these terms resonate with our experience of the last few decades (Oreskes and Conway, 2010). Capitalist states are characterised by their simultaneous functions of reproducing the conditions for continued (and expanded) accumulation, while being held responsible for the mitigation or partial correction of the adverse social and environmental consequences of that same system of production and consumption (e.g. Ioris, 2014).

While we need governments to act and policy coordination through initiatives such as the COP process are vital, they are not sufficient and we cannot depend on them. Political pressure and grassroots changes from below are just if not more important. And transformation has many parts. These may sometimes be disparate but can be given a direction of travel. To begin with we need something better than the current sustainable development goals (Weber, 2017), something which begins from debt jubilee and which stops systematically taking from the poor in ways that produce and reproduce poverty and structural inequality within and across countries (Hickel et al., 2021). Without this there will always be motives for neoliberal varieties of 'development' within the prison cell of debt servicing. A change here provides a precursor to financing other changes and the combination might underpin the implementation of 'just transitions' at the global and local level (Newell and Simms, 2020).

With just transition comes the possibility of a feasible 'good life for all *within* planetary boundaries' (O'Neill et al., 2018; O'Neill, 2018). But for this to occur we need also to encourage critique of forms of theory and practice that invite complacency. As the many essays in this special issue suggest, we need to unlearn in order to move forward and nowhere is that more important than in terms of the role of mainstream economic theory. Moreover, we need to stop putting faith in technofixes that continually invite us to delay taking action in the here and now (Dyke et al, 2021; Morgan 2020). The COP process, however, is currently heavily invested (in both senses of the term) in technofixes, rather than consistently recognises that technology is merely an aspect of a *differently founded* future, one that recognises 'enough is enough' (Dietz, O'Neill, 2013). Ultimately we need to move past the 'bullshit' (Stevenson, 2021) and we need to start unmaking the future we are currently making.¹¹

As one of us has previously written, we 'are living in a time of exception. A time when the existing order is open to question' (Gills, 2020: 577). The triple conjuncture of climate change and ecological breakdown, global pandemic and neoliberal economic globalization speak to a Great Implosion, and while the pandemic will eventually end, responses to it have created a precedent. Governments can mobilize to address imminent crisis. 'Deep restoration' is possible. 'The time we had grown accustomed to feel and were socialized to understand as normality, and to regard as the only reality (i.e. the linear time of capitalist modernity) is now suddenly exposed as only one stream of time' (Gills, 2020: 578). But for this to be achieved we need new ways of thinking. 'Transversalism' is one possibility. Rather than co-option:

Transversalism aims at consolidating political coalitions and achieving ideational accommodation between social groups... it does not imply uniformity or a general theory of social emancipation... [it] consists of the following elements: (1) recognition of diversity and difference, (2) dialogue (deliberation across differences), (3) systemic self-reflection, (4) intentional openness (intention to explore the reality of the Other), (5) critical awareness

of the intersectional nature of power relations that affects interconnections, and finally (6) commitment to creating alterity through hybridization and creolization of ideas and actions. (Gills and Hossieni, 2021)

That other worlds are possible does not disembody our species from the material world. The very need for us to develop a different way of living is because we need a different relationship to the environment on which we depend. Transversalism is simply a tentative guide for praxes and there are likely many similar, since it does no more than recognise decisions need to be made, populations need to mobilise, and action needs to be taken. Now. This can be democratic or it can follow a more ominous and increasingly authoritarian route if states and corporations do not match rhetoric to reality and our civilizations slide towards the dystopia science fiction has popularised.

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¹ The Kyoto protocol defined the GHGs as: Carbon dioxide (CO₂), Methane (CH₄), Nitrous Oxide (N₂O), Hydro-fluorocarbons (HFC), Perfluorocarbons (PFC), Nitrogen Trifluoride (NF₃) and Sulphur Hexafluoride (SF₆).

² To be clear this creates a whole set of issues regarding the tendency to rely on modelled findings given the models cannot cope with fundamental uncertainty and it is highly debatable whether they can overcome this if it is an intrinsic aspect – as highly constrained scenarios, however, they provide a resource for prudential conduct (if placed in the context of further and fundamental uncertainty).

³ Ed Hawkins, Reading University, UK, cited in New Scientist, 9 August, 2021 ‘Earth will hit 1.5C climate limit within 20 years, says IPCC Report’.

⁴ See: <https://scientistrebillion.com>

⁵ See, for example, Richard Smith’s work on China which makes the case that China’s engine of growth does not reduce only to ‘market drivers of capitalism’ but rather also involves ‘statist-nationalist extra-economic drivers’ leading to ‘overproduction, over construction, overdevelopment, profligate resource consumption and wanton dumping and venting of pollutants.’ (Smith 2020: xxi-xxii). And according to Smith: “For more than a century the US was the world’s largest CO₂ emitter by far. But its emissions declined from their peak of 7,370 million Mt CO_{2e} (metric tons of CO₂ equivalent) in 2007 to 6,457 million Mt CO_{2e} in 2017, reflecting the ongoing replacement of coal-fired power plants with solar, wind and lower-emissions natural gas energy sources. The emissions of the European Union countries have also trended downward over the past three decades, from 5,654 million Mt CO_{2e} in 1990 to 4,206 million Mt CO_{2e} in 2017. To be sure, these declines are far from sufficient to reverse global warming – they aren’t even enough to meet their commitments to the 2015 Paris Agreement on climate change – but at least they were declines. By contrast, China’s carbon emissions have relentlessly grown, quadrupling from 3,265 million Mt CO_{2e} in 1990 to 13,442 Mt CO_{2e} in 2018... [Though China is the world’s biggest investor in and producer of renewable technologies across economic sectors it continues to build coal power production facilities and capacity] China isn’t replacing fossil fuels with renewables so much as building more capacity of *both*. [And China’s emissions have grown faster than its proportion of the global economy, China’s emissions overtook the US in 2005 then] in just twelve years from 2005 to 2017 China’s CO₂ emissions nearly double again to more than twice those of the US. Yet China’s GDP was only 63% as large as the US GDP in 2017... [While] Per capita CO₂ emissions surged past those of the EU six years ago and are now half those of the US (7.45 Mt CO_{2e} vs. 15.56 Mt CO_{2e} in 2018). Yet China’s per capita GDP was just 15 percent that of the US in 2018 (\$9,627 vs. \$62,904).” (Smith 2020: xiv). See also Gills and Morgan (2020a).

⁶ Visit: www.exalt.fi

⁷ Note: the UNEP recently published *Making Peace With Nature* (UNEP, 2021), and while this has many useful arguments and suggested initiatives it also makes the case for a full cost accounting of nature and this involves some deeply problematic issues as Spash and Hache note (2021) in regard of the Dasgupta report.

⁸ 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>

⁹ See also: <https://ukcop26.org> and <https://unfccc.int/process-and-meetings/conferences/glasgow-climate-change-conference>

¹⁰ The list of included contributions includes: Gills and Morgan (2020b); Spash (2020a); Hickle (2020a); Trainer (2021); Galbraith (2020); Spash (2020b); Keen (2020); Asefi-Najafabady et al. (2020); Gills and Morgan (2020c); Bacevic (2020); Koch and Buch-Hansen (2020); Dale (2020); Fox and Alldred (2020); Goodman and Anderson (2020); Egmore et al. (2021) and Steffen and Morgan (2021).

¹¹ There are numerous sources here including the work of Heikki Patomäki (e.g. Patomäki, 2011).