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THE AUSTRALIAN FABIANS REVIEW

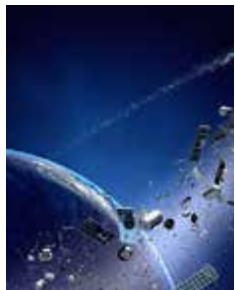
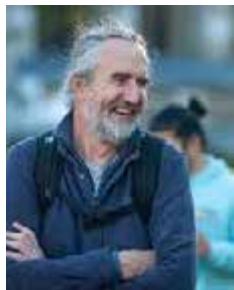
ISSUE 8



*A
call
for
courage*

SPECIAL PLANETARY EDITION

What do all of these have in common?



1. Flowering Plants, Antarctica
2. Roger Hallam, conservationist, Jail
3. Fig the (Mainland) Fruit Bat, Tassie
4. Capt Watson, conservationist, Jail
5. Earth's Atmosphere, Human Junk
6. Israeli bombs, Palestine
7. Vladimir Putin, Ukraine
8. Homelessness, Sydney CBD
9. Donald Trump, White House
10. Wildfires, Amazon Rainforest
11. 46,000 Aussie Children, Homeless
12. Logging, National Parks
13. Artificial Intelligence, Music & Art
14. Garbage Patch, Pacific Ocean
15. Gina Rinehart, Amazon Rainforest
16. Australian Industry, Offshore
17. Microplastics, Human Blood
18. Spratly Islands, South China Sea
19. Refugees, Australian Detention
20. Mining, Indigenous Heritage Sites

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FABIANS REVIEW,
ISSUE 8

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EDITORIAL

In This Issue

DR PAUL READ

Answer to the front page quiz? They've all been in places they shouldn't be—everyone from activists in jail and little bats in Tassie, to mining conglomerates and warmongers in other people's countries. Thankfully, Capt Paul Watson and Dr Roger Hallam are now out of jail whereas Fig the Fruit Bat was safely rehoused back in Victoria thanks to Fly by Night Bat Clinic.

Welcome to Issue 8 of the Australian Fabians Review, a special edition dedicated wholly to the issue of planetary health, one which we recently discovered was the topmost issue of concern to our youngest membership, even before more immediate challenges like impenetrable housing costs, wage theft, flagging government services, and the broken social contract that is Australian education.

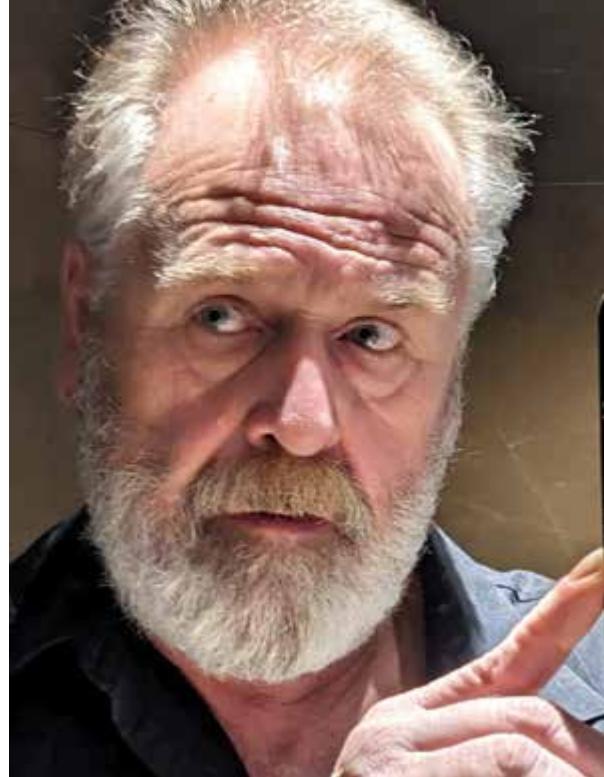
This special edition on planetary health is not the usual fare of the Fabians Review but certainly one that resonates with our long tradition of tackling the hardest of issues. As Prof Ross Garnaut said when he last attempted to raise the carbon tax during the height of the 'climate wars' (against Tony Abbott), it's the wickedest of problems. This is because climate change arises directly from systems of government and industry that subserve human survival in the first place. In other words, our immediate survival hinges on systems that are actively eroding our future survival.

The tragedy is that just as the climate wars ended (wherein the science was finally acknowledged as science rather than propaganda), the multiple threats

of war, COVID and the global cost of living deflected public focus from the real and imminent threats to longer term planetary integrity, the Children's Crusade of Greta Thunberg all but forgotten. What's more, the threat of climate change is being rapidly matched by two lesser-known threats of equal importance—species extinction and environmental pollution, the subject of several articles that follow.

At heart, as will be shown, all of these raise profound issues of global, intranational and intergenerational equity that resonate deeply with the spirit of Fabianism. As will be seen the renowned climate theorist Aubrey Meyer says the very heart of sustainability derives its beat and rhythm from environmental justice, intra and international equity. His concept of 'Contraction and Convergence', which Garnaut lauded as the primary equity lever for global climate negotiations, remains the strongest contender, outside of technological innovation, for the acquittal of the Paris Agreement. And on that, we report on two new research papers suggesting the Paris Agreement of no more than 1.5 degrees has been officially breached as of Valentine's Day, 2025.

Even as Fabians celebrate 141 years of leading progressive policy, there are few issues more pressing than the threefold challenges of climate, extinction and pollution, made all the more relevant by their underpinnings in the realms of justice and equity. Just as we need the likes of C&C to unite nations along an agreed equity lever that lift both developing and developed nations, we now have runaway



Fabians Review Editor, Dr Paul Read

inequality within the richest nations, to the extent that Australian and global inequality have both grown tenfold in only ten years. This at a time when convergence, even the types of moderate convergence often seen in Nordic countries, would painlessly achieve sustainability without any loss of human life. All hinging, of course, on achieving human equality.

As we roll through the complexities of evidence-based policy, obstacles, threats and optimism, note the evocative artworks by our friend, ally and fellow Fabian Carl Gopalkrishnan, who kindly offered us a whole series of original works for this edition. Appropriately, they vacillate between hope and horror. His main title, *Supernature*, is inspired by a 1970s song with lyrics still resonant to the present day. [You can listen to it here.](#)

And here are some of the more damning lyrics from *Supernature*:

“You can’t escape, it’s too late
Look what you’ve done
There’s no way that you can help
And the monsters know you were there”

We hope it’s not too late but as will be seen even our most ardent champions are flagging in terms of optimism for a carbon constrained future in which humanity thrives.

In this edition we cover so much material that it splits into three main themes—politics, climate, and extinction (itself split between land and ocean). Under POLITICS, we start with Dr Jim Chalmer’s

Wellbeing Budget and its planetary implications (due for an update in October 2025), followed by a brief summary of mounting evidence from 2025 and a feature essay by Gregory Andrews, a D’harawal man and former Ambassador and Threatened Species Commissioner, who undertook Australia’s longest climate hunger strike on the lawns of Parliament House in 2023. In his article he rips the lid off the issue of climate injustice. He says powerful figures like Gina Rinehart are profiting by exploiting our mining and fossil fuel resources with the support of huge government subsidies. As he says this is hardly a ‘fair go’ for all Australians, especially when the most vulnerable are hit hardest by rising energy costs, homelessness, food insecurity, floods, heatwaves and bushfires, all sequelae of the fossil fuel banquet upon which Gina and colleagues profligately dine.

In a similar vein, Prof David Karoly, who jointly won the IPCC Nobel Prize in 2007, explains the critical need for Australian leadership in renewables after decades of coalition laggardliness, and celebrates the unique contribution of Indigenous knowledge to future sustainability. Following this, The Hon Penny Sharp, NSW Minister for Climate Change, Energy, Heritage and the Environment, takes up a similar theme as she traces the woeful history of the LNP kicking the can down the road for nearly 30 years and instead outlines the serious efforts to transition from coal to renewables with a focus on job readiness for net zero. Dr Tony Webb wrote the next paper prior to this year’s landslide win by the Albanese government,

indeed prescient of the miserable failure of Dutton's nuclear proposal to gain traction in the Australian electorate. After outlining the very real health impacts of nuclear radiation, we can breathe a sigh of relief in retrospect that the LNP didn't win power.

Moving on from Australian politics, we move to the CLIMATE section, wherein two exemplary papers of key importance are offered by our international guests, world-leading US oceanographer Prof Annalisa Bracco and Danish architect and activist Kasper Benjamin Reimer Bjørksov. Prof Bracco says we need more than renewables; we need \$1 trillion US invested globally in a multi-country, multi-sector effort to achieve carbon dioxide removal (CDR) technologies that draw 10 gigatonnes of carbon out of the atmosphere every year by 2050. Whilst it sounds daunting, she points out that this figure is not so impossible if the political will is behind it—Australian superannuation, the US defence budget, and even the top 10 richest individuals could literally save the planet! Whilst CDR technologies are a solution based on technology, Kasper takes the opposing argument in favour of degrowth strategies that shift the mindless focus on economic growth to a more consumer-led revolution in the economics of sufficiency. His brilliant article is an impassioned plea for a focus on social flourishing, public health and human wellbeing. As will be seen, a great many arguments in this edition likewise support the efforts of Dr Jim Chalmers if human wellbeing can be, in the spirit of Kate Raworth's doughnut economics and the World Happiness Report, contextualised and satisfied equitably within planetary boundaries. This, when combined with new technologies boldly applied, could offer historically unprecedented levels of human flourishing in a climate constrained future.

The next three articles complete the climate section by taking up these broad themes. Professor Jennifer Gidley, from the UTS Institute for Sustainable Futures, starts with a cogent summary of the past five years of Australian and US climate policy prior to Trump's recent inauguration. Crucially, Prof Gidley reiterates many of the emergent themes that neither mitigation nor adaptation alone are sufficient to pull the planet back from the brink; rather she points to the need for co-evolution of human agency in driving both land and ocean regeneration, to fast track carbon capture solutions and regenerative ocean farming. The next article by the editor and former Fabians Chair Sarah Howe and post-graduate student members of the Future Emergency Resilience Network (www.fern.expert) focuses on balancing two competing themes—first with a summary of

the growing urgency and the mounting alarm with which climate records are being smashed and then with a broad-brushed attempt at pulling together all the many technologies that could be integrated and retrofitted into local Australian communities. After summarising recent evidence that the 1.5 limit of the Paris Agreement has already fallen, this article is a bold attempt to paint a more promising picture of what Australian life could be like in a climate constrained future. Dr Tony Webb contributed to the editing of this article and so it seems fitting to end the climate section with his own article in which he brilliantly dismantles, using sound arguments and empirical evidence, all the conservative objections to Australia abandoning its reliance on exporting fossil fuels, yet another dig at the Rinehart contingent, Reiterating the totality of the climate debate thus far he concludes that it's way past time for Australians to stop pissing into the wind on the climate crisis!

Here, I'd like to quote Prof Glenn Albrecht, neologist, philosopher and former professor of sustainability at Murdoch University, speaking on the 'death cult' ('symbiocide') of the global economy from Australia to an international audience for R21C on 23 June, 2024. He 'neologises' with gusto.

"We are in WWIII. In the 'symbiocene', there are many ways of being human and it's a lot happier and healthier than the toxicity of the anthropocene. We need a new language for Nature, to overturn the dominant narratives and change the choreography of the dance with Nature; to move away from 'terraphthoric' exploitation towards 'terranascent' people who are earth creators—lovers of Nature. The war is between these two types of people, and if the latter win, we win eutopia. Sumbiocracy then becomes a new form of rule for the Earth, by the representatives of the Earth, so that all living beings might live together."

And in that spirit, we move to section 3 of this edition, focused on EXTINCTION, wherein we are introduced to an army of terranascient champions—activists, scientists, poets and artists—pulling back the world from the brink of the Sixth Mass Extinction. Here, we turn to the plight of animals and plants and whole ecologies falling to the march of capitalism, starting with the extraordinary adventures of one diminutive but courageous Australian fruit bat called Fig, a story told by conservationists Melissa McLay and Charlotte Read. Dislocated by climate change, Fig found himself moving ever southwards from the mainland, buffeted by the winds of Bass Strait, until found entangled and exhausted hanging upside down in a

farm in Tasmania—our cutest climate refugee. This signatory tale of the ‘chiropteran in the coalmine’ then introduces the work of the climate rebels.

The next articles, in recognition of the mounting urgency of the polycrises facing the planet, stray from the incrementalism favoured of the Fabians by exploring the boots on the ground, the tactics of rebels and even revolutionaries as they fight coal, capitalism and callous disregard. Three rebel stories follow that feature leading stalwarts. Extinction Rebellion founder, Roger Hallam, says if you’ve not been in jail, you’re not doing your job properly. Here we talk with some people who *are* doing their job properly on behalf of the Planet—Dr Ginny Barrett (Extinction Rebellion), Kyle Magee (Frontline Action on Coal), Captain Paul Watson and Roger Hallam himself. All have been in jail for their causes and all are unapologetically taking variously strategic approaches to fighting the good fight. Indeed, one of the final in this set of articles outlines how Roger Hallam hopes to build an interconnected set of citizen’s assemblies across 40 countries to achieve what he calls a ‘little revolution’—a bloodless and gentle takeover of government that puts people and planet first.

Finally, a different kind of activist is featured, one who’s not been in jail but has battled fierce squalls and moments of blood-curdling challenge as she sails solo and breaks records to highlight the impact of climate change on the world’s oceans. Ice maiden Lisa Blair passionately highlights the plight of the world’s oceans with reference to the Great Pacific Garbage Patch and the ways in which microplastics are inveigling themselves into everything from the depths of the Mariana Trench to the heights of the human brain. Which links beautifully with Captain Paul Watson, who highlights the global impact of deep-sea mining due to start in 2026. He argues we must temper our destruction of the planet and, as Patricia Vickers-Rich suggests later, embrace a less anthropocentric type of compassion—what he calls Biocentrism.

This introduces the importance of the Biodiversity Council fighting to put species protection on the Australian political map. Director Prof Brendan Wintle, in the next article, highlights sobering data that Australia has lost habitat the size of Tasmania since 2020 alone. He describes the establishment of the Biodiversity Council and its ongoing mission to fight for Nature in the Australian context. This is followed by a much longer geological timeframe—all the way back to Gondwanaland—in the longstanding work of Australia’s Emerita Prof Patricia Vickers-Rich

AO, a palaeobiologist and geologist who has studied the changing climate and its effect on Australia’s biota stretching almost a billion years. She calls on people to recognise the need for compassion, not only for Nature but also each other—a fitting call for courage that resonates with the words of the great Dr Jane Goodall. Bringing us full circle.

And with that, dear readers, we conclude this edition, which happens to be my last for this publication as I hand over gratefully to the talented Dr Amanda Rainey. You’ll also note I had ample assistance from my children writing articles whilst I convalesced in hospital this year—Hamish is working with the productivity taskforce and Charlotte is well known in conservation. Long in the making, we had to stop at some point to publish because the news and science and developments are accelerating—floods, fires and policy failures hitting the news stands and social media daily, and now much complicated by geopolitical implosions worldwide. Tragically, we have moved from the relatively benign era of the courageous Childrens’ Crusades of Greta Thunberg, much maligned by right-wing media and governments, to a new period overshadowed by ever more diabolical existential threats—the deaths of children in Gaza, the rising tides of technofascism, erosion of democracy, the spectre of AI, obscene inequality and the possibility of managed decline leading to the disempowerment and impoverishment of citizens worldwide—all developments entirely counter to the optimism embodied by many of the articles, activists, poets and artists featured in this edition.

As Fabians with a proud tradition of creative and courageous thought leadership we have a duty to go beyond the parlous state of world politics and traditional philosophy, to break down false siloes in the binary spectrum of left versus right, to boldly confront the wicked problems, and to counter it with redoubled intelligence aiming at a dialectic of transcendent, empirically driven political economy, transforming what appears to be geopolitical doom into optimism and hope for future generations—an entirely new and inclusive picture of integrated socioeconomic flourishing within planetary boundaries. This is a huge ask and a huge task. But without it, I fear, we might perchance be taking up, collectively:

Pistols at Dawn.

OBITUARY

Vale Dr Jane Goodall

3 April 1934—1 October 2025

DR PAUL READ

Jane's good friend, Capt Paul Watson, who writes in this issue, said of her "Jane Goodall left us with a poignant message of resistance and hope. Her work continued to the very day of her death and her message will live on for centuries. She is deeply missed but will never be forgotten."

Her final message to the world is here.

Magnificent words, a message of hope and deep empowerment for generations to come, prescient of her own end, which came six months after this recording. She says: "I want to make sure that you all understand that each and every one of you has a role to play. You may not know it, you may not find it, but your life matters and you are here for a reason. Don't give up. There is a future for you."

Below, Capt Watson shares Jane's personal letter to him supporting his work and celebrating his release from jail in January this year. This hand-written letter was typical of Jane's compassion, courage and creativity, even in the end suggesting books be written for children to highlight the plight of our natural world and bring awareness to the whole of Asia and beyond regarding wildlife trafficking and misuse of animals.



2nd January 2025

Dear Paul,

News of your release from prison was the very BEST Christmas present ever. The photos of you and your family had me in tears.

Let me say, before anything else, that I am truly sorry I did not answer the letter you wrote me from prison. It will always be one of my most treasured possessions.



Leakey Fifi Faben David Greybeard Bo (Della) Mike

I received it during my crazy Asian tour - 6 countries (India, Malaya, Sia, Singapore, Hong Kong & China) in just under 5 weeks. I kept waiting for a peaceful moment to write all I was feeling - & that moment did not come. And before I could write came the wonderful news that you were free! You did say, in your letter, that you were fairly certain that you would NOT be extradited to Japan.

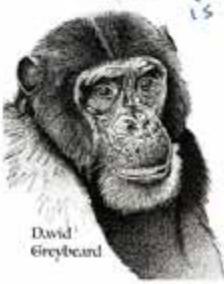
As you said, your ordeal has at least spread the horror of whaling far & wide. Far more people are now aware of the (quite unnecessary) cruelty

2..

I have been peripherally involved in the illegal wildlife trafficking, working at the demand end of the trade. In particular working through young people - who often can influence not only friends, but parents and grandparents. JGI's movement for young people of all ages - from kindergarten through University - is now in 72 countries. Including Japan.

So I have been wondering how best to develop

Rootsandshoots.org



David Greybeard

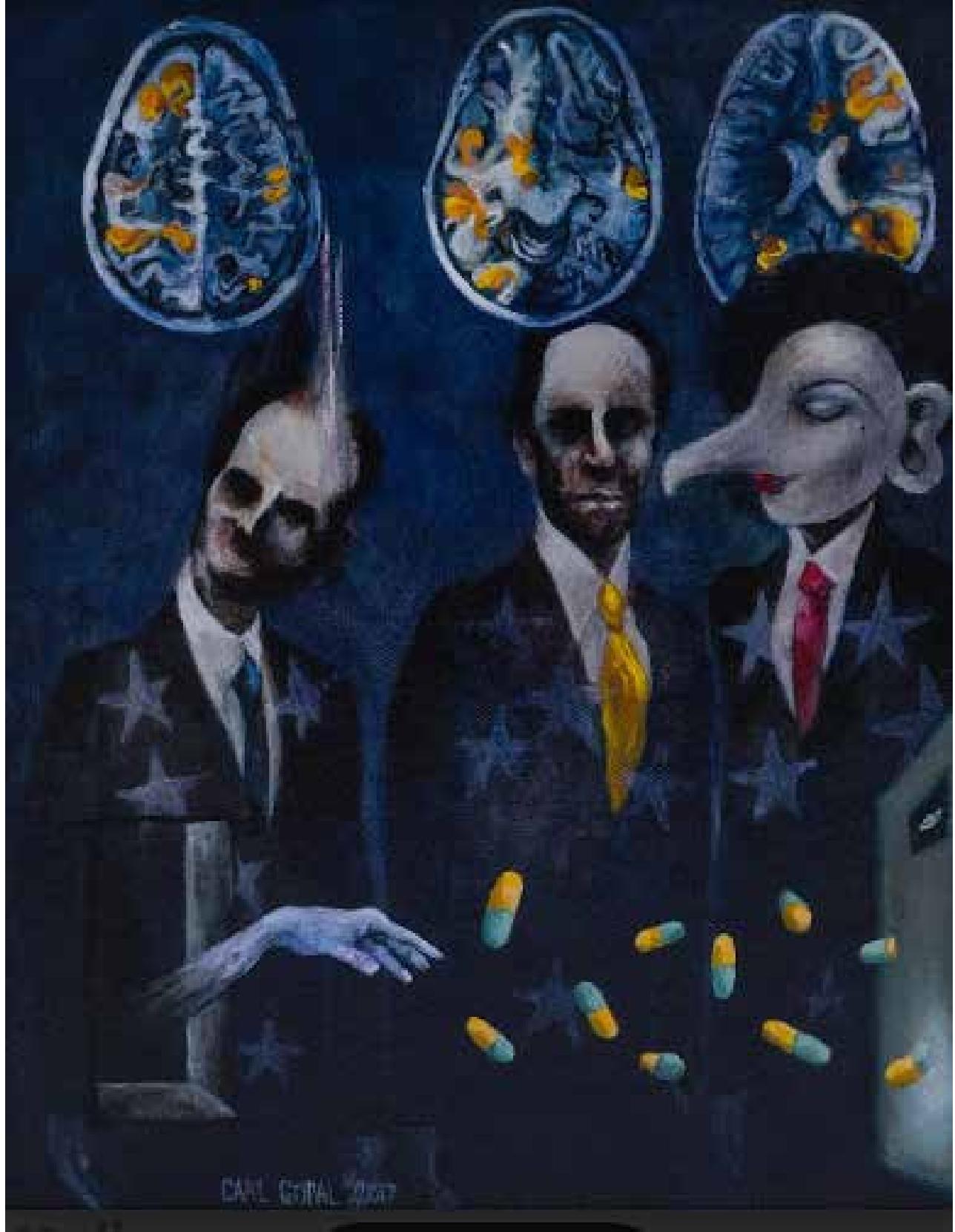
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an understanding of whaling in that country. Not casting blame but spreading awareness. Many people are not even aware of the whaling issue.

A book for younger children - perhaps a baby whale whose mother is harpooned - but who does not die & is perhaps saved in some way. And for older children - perhaps some kind of adventure - stowing away in a Sea Shepherd & seeing a brave & successful operation to save a particular whale.

Just an idea. Thoughts? Sending love, Paul. You've had such a great start to 2025. Love



Constitutional Crisis

CARL GOPALKRISHNAN

POLITICS

The Wellbeing Budget

Measuring What Matters for People and Planet

PROF PAUL READ

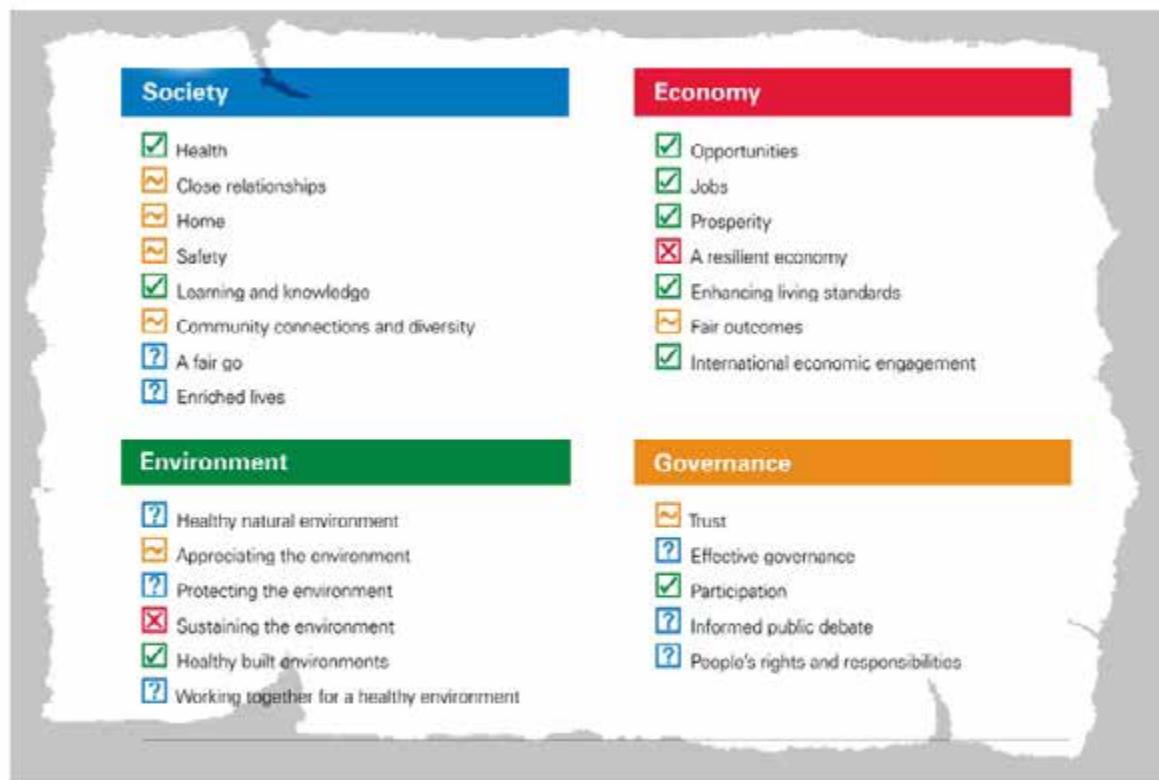
Apocryphally, it is said that Einstein once said that *not everything that matters can be measured, and not everything measured actually matters*. Whether he said it or not doesn't matter. The point is that evidence-based policy has been crying out for holistic measurement of human flourishing for decades and few governments have had the courage to nail their colours to the mast.

The Wellbeing Budget, one in March 2024 and another planned for October 2025, suffers all the same problems as the Sustainable Development Goals (SDGs), but therein lies its hope and promise. It's not perfect and some of the data is in desperate need of a post-COVID update but The Hon Dr Jim Chalmers' Wellbeing Budget is a signal of hope for multiple reasons relating to intergenerational equity, climate change, and future sustainability. This is because it recognises human wellbeing as a metric in its own right, alongside a dashboard of indicators of which GDP is but one input to the system as a whole. We'll return to its role in climate change and sustainability but suffice for now that wellbeing as a social measure has the capacity to help theoretically integrate the SDGs themselves as well as improve the lot of ordinary Australians. It pulls together many disparate

and often competing indices into a global system, whilst helping signal to the world, alongside Wales, Scotland, Iceland, New Zealand, Germany (and before all of them, Bhutan), that social flourishing is a truly multidisciplinary endeavour and the proper goal of economic output.

Wellbeing is not, as former LNP minister Josh Frydenberg would have it, some trussed up hippie esoterism, but has a long history of sober quantitative analysis spanning half a century, led by economists, sociologists and neurologists to build on a history of philosophy going back to Aristotle, through Enlightenment thinkers like Bentham, to the modern day. In 1975 two notable classic curves across countries were produced by Easterlin (1974) and Preston (1975), almost simultaneously, demonstrating the effect of GDP on subjective wellbeing and life expectancy respectively. Both were, in contrast to the assumptions of classical economics, curvilinear. They didn't grow with greater wealth but stabilised at a plateau, at least cross-sectionally, and even suggested that greater economic growth (and so carbon emissions) could be antithetical to human health and wellbeing. The fact that they both demonstrated the same characteristics act as a form of convergent





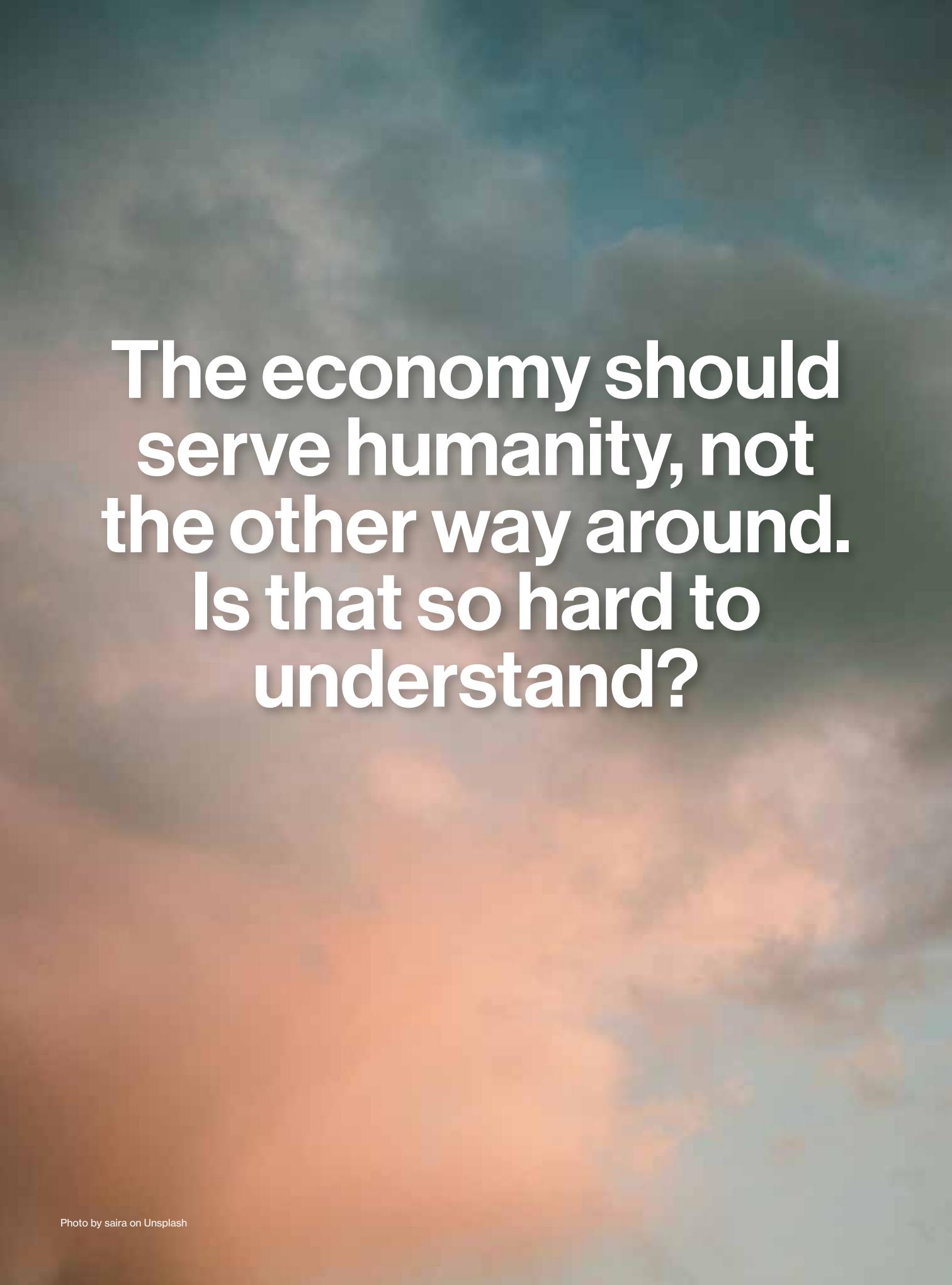
ABS Measures of Australia's Progress 2013 (*Supplied: Australian Bureau of Statistics*)

validity and the same curves have emerged for every year for half a century since. As well as Easterlin and Preston, the recently departed sociologist (and friend) Ruut Veenhoven (1996) dedicated a lifetime to harmonising data across countries; psychologist Diener (1984) examined wellbeing across cultures, Nobel laureate Khaneman (2006) brought it into mainstream economic theory, Marks and associates (2006) introduced it to sustainability with the Happy Planet Index. A vast literature unknown to Frydenberg has grappled with serious quantitative and scientific issues surrounding its measurement. Now countries are taking notice.

After generations of focus on GDP—a metric even its own architect Simon Kuznets (1934) criticised for failing to measure human wellbeing—we finally have a paradigm shift regarding economic growth not so much as the main outcome of good governance but merely one of many inputs to human social flourishing. That the Wellbeing Budget should come as an initiative under a governing Labor Party in Australia is hardly surprising given most of Australia's historic contributions to human welfare—the eight-hour day (1856), women's voting rights (1861), the secret ballot (1858), legalising trade unions (1876) and many more—became world firsts under the

spiritual tradition, if not the official banner, of Labor.

Dr Jim Chalmers, who did his PhD on political science and public policy, first floated the idea of a wellbeing budget in 2020, to which then Treasurer Josh Frydenberg, responded by scoffing at the idea as laughable. This doesn't surprise me as I recall discussing the concept with Frydenberg's colleagues at ADC Forum as early as 2013 and receiving the same response. Three years earlier I'd also received dumbfounded scorn when presenting the concept of a wellbeing dashboard to the Australian Bureau of Statistics, even as I explained the results of the Sarkozy Commission (Fitoussi, Sen & Stiglitz, 2010) recommending the same and driven by no less than two Nobel laureates in economics, Joseph Stiglitz and Amartya Sen. Long before this, in the 1990s, when I'd attempted to pitch the concept to university departments, so ingrained was the silo mentality that the faculty of economics told me it was a medical project, medicine told me it was better suited to politics, and politics sent me back to economics because it was too quantitative and beyond their realms of expertise. It took 15 years to find a home for a serious quantitative study of human wellbeing across countries and time—the Monash Sustainable Development Institute.



**The economy should
serve humanity, not
the other way around.
Is that so hard to
understand?**

Within disciplines, the knowledge and the data already existed 20 years ago and beyond to mount a tsunami of evidence in favour of Dr Chalmer's wellbeing budget, not just within Australia but worldwide. In fact, the first assault on the presidency of GDP came from Amartya Sen (1985, 1999) when he helped developed the United Nations Human Development Index (HDI), placing education and life expectancy alongside economic output. Since then, the HDI has lost currency merely because more developed nations have populated the upper echelons of the index. Meanwhile the UN and WHO curated some 10,000 variables capable of testing across time and nations to broaden the concept from single metric to dashboard. But it's taken decades for academies and government departments to catch up, to realise that we've now surpassed the point where any one discipline can address wicked social problems. The answers now lie inexorably in the gaps between disciplines. And this Labor government is the first to have the vision and courage to embrace this new empirical reality, one that represents a step change in post-Enlightenment scientific method, not only for the sake of the Australian citizenry, but for generations to come.

After decades of neoliberal growth economics, the dominant discourse from the Chicago School based almost entirely on the hard-nosed idiocy of rational choice theory, the concept of wellbeing, which embraces much more of the human condition than viewing people as mere 'lightning rods of pleasure and pain', has finally reemerged, nearly 250 years after Adam Smith (1776) first wrote the word 'wealth' with the original intention of capturing the breadth of social flourishing connoted by 'wellbeing'. Jim Chalmer's Wellbeing Budget builds on a wealth of new evidence that moves substantively towards what Keynes (1930) described when he said 'the day is not far off when the Economic Problem will take a back seat where it belongs and the arena of the heart and the head will be occupied or reoccupied by our real problems—the problems of life and human relations, of creation and behaviour'. No longer deflected by theoretical tangents, the Wellbeing Budget finally puts human wellbeing and social flourishing as the true and proper outcome of economic endeavour.

The economy should serve humanity, not the other way around. Is that so hard to understand?

Jim Chalmers' Wellbeing Budget is a signal of historical importance to the Australian market because it places human wellbeing as the apex of economic activity. This is critical, and perhaps almost too late, after half a century of efficiency economics

and rational choice theory driving privatisation, loosening labour laws, casualisation of the workplace, obscene profiteering, rising inequities, especially intergenerational inequities, erosion of community cohesion and its rippling effects. As the current Treasurer says in his introduction to the Wellbeing Budget, the dashboard of indicators has emerged from long consultation and is not designed to supplant but supplement the metric of GDP. That they chose to pursue a dashboard of wellbeing metrics is appropriate to some degree as a single metric of wellbeing has proved elusive, a veritable Holy Grail in the development literature, for decades.

Veenhoven's Happy Life Year (1996) was a valiant attempt, precursor to a new version by Layard (Helliwell, Layard & Sachs, 2017) from the Earth Institute. Both sets of data converge on the idea, of deep significance to the SDGs, that all major indices tend to operate in a curvilinear structure representing metabolic homeostasis (Cummins et al., 2014), where moderated (and so ideologically agnostic) optima appear to maximise both wellbeing and life expectancy. The same even occurs with GDP, wealth equity, and carbon emissions (Read, 2013), suggesting a moderated peak not only maximises human outcomes but simultaneously achieves a form of Pareto efficiency, wherein everybody wins including the planet and future generations.

The Wellbeing Budget could go a lot further, not just by updating the datasets and more regularly evaluating pockets of disadvantage, but extending the range of years and integrating its theoretical underpinnings. The data and methods today now exist to develop a hierarchical structure where human needs can be much more precisely targeted in a rollout based on the brutal efficiency of a cost:benefit analysis, effectively squeezing maximum utility from a series of strategic investments representing minimal, but clever, outlays. The methods available include a series of empirical tests that triangulate on the same data across countries, across time, and across multitudinous measures (even in some cases across species). The other issue is that wellbeing as a concept has some problems associated with serious social ramifications that emerge if careful distinctions are not made between happiness, quality of life, life satisfaction, marginal utility, revealed preferences, and a host of others. Part of the problem with the concept of happiness, both in religion and as a precept formulated by the US Constitution, is that it elevates one of many evolved emotions with distinct and important roles to play in human adaptability.

The importance of studying wellbeing across

countries (and species) is that most of the evidence of the past century has emerged from countries that are WEIRD—western, educated, industrialised, rich, and democratic. And so the assumptions of WEIRD researchers working from within WEIRD nations inevitably skew their understanding of human wellbeing, especially as the notion is awash with value-based assumptions, usually driven by the faddish preoccupations of the day rather than a fresh appreciation of time-invariant human needs that withstand the tests of time. Most of the data on wellbeing has been unassailably range-restricted to the experiences of wealthy westerners to such a degree that the only way to break through the invisible boundaries of the researcher's own culture has been to open up the range of inquiry to all countries, subcultures within countries, and even using evidence going back to paleolithic and pre-agrarian societies. Without opening up the range of inquiry, the notion of human wellbeing is straitjacketed into a worldview that is, inevitably, hopelessly unsustainable, vastly privileged, possibly patriarchal and mostly materialistic.

On a scale of 1-10, how satisfied are you with life as a whole? Note the word 'satisfied'. Thankfully, there's been a shift away from questions focused on the fleeting and philosophically questionable notion of eudemonic 'happiness' towards those based more on contentment and satisfaction of actual human needs, wherein policy can make a proper difference. As of 2023, this same question or a version of it has been asked of a total of 135 countries (by Gallup and Eurobarometer), some with data stretching back to 1960. Subjective wellbeing is a metric with a long history but often defies ratio measurement. At best it achieves an ordinal ranking, which means it comes with a host of statistical issues. It's important to make sure that the question is linguistically equivalent and back translatable, especially in a multicultural society, that the numeric scale is understood, and that the question varies appropriately with hard ratio metrics from the laboratory—things like cortisol secretion, dopamine, evoked potentials, neurological activation of reward centres and a host of others. It doesn't come without issues but it's a lot stronger as a measure than some would assume, my own work showing it varies appropriately with life expectancy and human height, not only in today's data but stretching back half a century.

And it doesn't end there. Beyond range restriction in time and culture, it is range restricted by academic discipline. As can be seen from the dashboard developed by Treasury, the concept of wellbeing is

necessarily multidimensional (although this comes with its own issues described later). And so, part of the traditionally visionless resistance resides in the academic silos of intradisciplinary parochialism that arise from scientific reductionism. Carving up little bits of the bigger problem so as to isolate causal relationships focuses the researcher, laser-like, on the minutiae whilst missing a much bigger holistic picture. It also means that parallel literatures emerged in different disciplines, all using different heuristics and developing different terminologies to describe what amount to convergent concepts. The problem of language has left all researchers in the field, as well as governments relying on their expertise, in a position where they must master multiple disciplinary languages, Babel-like, even before making sense of underlying theories with the capacity to tie them all together. Much like Maslow's hierarchy of needs, a lack of conceptual integration leaves Maslow, without the addition of a hierarchy, offering little more than a list. This is what happened with the SDGs—they were so desperate to be inclusive that every metric was hurled into the mix, even when half of them undermined the other in a spiraling dance of unintended consequences and internal feedback loops. They were a list in need of a hierarchy with no way of creating one.

When all the work of consultation has been done, when every discipline and pressure group has had its say in measuring what matters, the task of inclusivity satisfied, there still remains a yawning gap in theoretical integration, which is why the SDGs managed to include everything and explain nothing. All it did was add wellbeing and ecology to the Millennium Development Goals, hurling against the wall nothing much more than an impossible wish-list of aspirational demands that couldn't be measured because half the nations in the world lacked statistical capacity to measure what was asked of them. What's more, the underlying linearity of assumptions, and the perennial belief that more of everything is always better, meant that half the metrics on the dashboard counteracted one another. To achieve energy independence and equitable prosperity across and within nations, inevitably meant wholesale destruction of marine and terrestrial ecologies, thus demolishing equity across generations and into the future. This is the tip of the iceberg.

The vastness of applying quantitative reductionism to the interconnected issues of climate, intergenerational equity, and human wellbeing was left to meta-analyses and literature reviews, and rarely among researchers capable of seeing outside of

their own discipline. Or else it was left to artists. Big picture thinking and reductionistic scientific method are hard to do at the same time.

The Wellbeing Budget hosts a range of proxy indicators within a five-fold dashboard that stands on the principle of equity. The metrics in Table 1 are paraphrased for brevity.

Health	Security	Sustainability	Cohesion	Prosperity
Life Satisfaction	Accessible Justice	Air Quality	Inclusion	Access to Work
Care & Support	Child Abuse	Biological Diversity	Creativity	Child Development
Health Services	Violence	Climate Resilience	Discrimination	Digital Literacy
Life Expectancy	Feeling Safe	Economic Resilience	First Nations Languages	Education
Chronic Illness	Homelessness	Emissions	Political Representation	Household Wealth
	Housing	Fiscal Sustainability	Sense of Belonging	Inequity
	Cost of Living	Protected Areas	Social Connections	Innovation
	National Safety	Waste	Recreation	Job Opportunities
	Online Safety		Trust in Public Services	Job Satisfaction
			Trust in Institutions	Literacy & Numeracy
			Trust in Government	Income Per Capita
			Trust in Others	Productivity
				Job Security
				Skills Development
				Wages

A Brief Snapshot

Issues abound here, just as they do within the SDGs. In Australia, overall life satisfaction continues to fall since 2014 whereas people older than 70 maintain the highest levels, along with the lowest homelessness. Here emerge issues of intergenerational inequity—those above 65 own 70% of Australia's wealth despite representing only 16% of the population. Our own Fabians work on suicide, deaths of despair and wellbeing (see Issue 6, *'Waithood'—Australia's suicide crisis in younger generations*) suggests there is likely a survival effect that requires measurement using Kaplan Meier curves to account for generational attrition. For life expectancy, gains since 2003 disguise a major slowing, and reversal in some age groups, as most of the heavy lifting is being done by health services keeping people alive rather than the economic system creating healthier lifestyle outcomes with a focus on prevention.

To this, evidence comes from a range of other variables—rising chronic illness in the middle class and inner regional residents (the same group), rising

homelessness (in all but older groups on average), rising housing costs and cash flow problems since 2014, rising irregularity in jobs (affecting almost 30% of all Australians), falling leave entitlements, and cost of living. Later, data shows rising participation in creative pursuits only among the young, suggesting a broad shift from material to experiential consumption values in this age group, partly driven by embracing more sustainable lifestyles but also because they have all but given up on saving for home ownership.

In only three years leading up to 2022, the percentage of people suffering some form of online attack rose from 58–75%—trolling, pornography, bullying and identity theft. The sexual and family violence data fails to measure data across time and typically underestimates male rates due to under-reporting (previous self-report surveys by the author found equal sexual victimisation between men and women). Some of these measures, like feelings of safety and trust in institutions have been standard questions in international datasets for decades. Though useful they could be vastly improved. Superimposed over all of this is a rising sense of fear surrounding geopolitical events at a global level, the

metric of national safety having fallen from 90% in 2005 down to 53% in 2022.

The newly created Australian Disaster Resilience Index shows a high of 80% of the population living in moderate to high risk of natural disasters (for more see www.fern.expert). Greenhouse gas emissions have been falling steadily (by 27%) since 2007, as they should as Australia was among the top three emitters, and much of this has been from efforts to embrace renewables. Air quality has been improving since 2019, as have protected marine and terrestrial ecologies, but biological diversity is still falling rapidly and needs bold policy adjustments to reverse the trend. Both humans and animals sustained a massive hit during the 2020 megafires, from which some species never recovered. A similar issue resides in the waste metrics. Whereas waste generated has risen from 2.8–3 tonnes per person since 2014, at least the amount being recycled has risen, at least officially, from 60 to 63%, a small gain yet both vast improvements on 49% in 2008.

Although recently fashionable to include economic and fiscal data under the sustainability banner this is a faddish approach due in large part to greenwashing efforts by major corporates and sloppy adoption of jargon. The values are entirely antithetical to one another and should never be grouped as if they maintain intercorrelated factor structures. This is misleading to untrained readers. Notwithstanding this minor criticism, economic diversity is improving when ranked against other nations but note that economic complexity, though it reflects economic diversity and so resilience, also harbors within it deeper and more intractable carbonisation and an erosion of human freedoms—more interdependence and more economic interactions can often impede social flourishing at a human and ecological level. It is akin to the Asian Development Bank measuring national human and economic development by satellite measures of concrete paving against forestation—a failed and misleading proxy that could be replaced with superior measures or else weighted. Gross debt to GDP ratio, representing fiscal responsibility, has skyrocketed from 8.8% to 54% since the GFC, making the Labor promise of a surplus the first in 15 years.

Of the social cohesion metrics one promising outcome is the rise in First Nations languages being spoken at home, from 50,000 to 80,000 in 20 years—a move towards reversing cultural extinction. Another is that 20 years has seen parliamentary

representation shift from predominantly white men to values closer to proportional representation of women (now 45%), indigenous (4.8%), and LGBTIQA+ (3.5%). Likewise, the gender pay gap has fallen from 18% in 2014 to 13% in 2022.

Sense of belonging, especially as it relates to the Australian way of life, has declined from 100% in 2007 to 81% in 2022. This could be related to demographic shifts in those born overseas. For example, the proportion of households speaking a language other than English has risen from 16 to 22% over the 14 years preceding 2021, representing a demographic shift accounting for 6% of Australian respondents being new arrivals, mostly reflected in rising numbers of people speaking Chinese Mandarin and Punjabi. This then partly explains why acceptance of diversity has risen to 78%—the two metrics are correlated and so partly redundant. They also converge on the finding that 16% of people born overseas have suffered discrimination over the past 12 months, but not much higher than the national level at 13%.

In all, Dr Chalmer's efforts to put Australian wellbeing on the economic dashboard is perhaps one of this government's most laudable achievements so far, paint a picture of Australian flourishing that signposts a range of critical social issues looming on the horizon. If it can be harnessed, strengthened and tightened into its full potential it will become, I dearly hope, a dashboard of immense significance not only for sustainability but for the Australian people. I also hope it offers empirical evidence driving policy that will once again rebuild the social contract that has been sorely eroded by decades of obscene inequality and bad policy focused on the moronic single metric of GDP growth so beloved of the opposition. Dr Chalmer's has produced a signal that Australia is finally taking the wellbeing of its people seriously, and hopefully this will embolden courageous policy for the younger generations so desperately in need of true and abiding hope for a better future—not one smashed by fossil fuel subsidies, collapsing ecosystems, geopolitical tensions, job and housing insecurity, food and water shortages, rising dependency ratios and inflation. If we can shift our economic focus to human wellbeing within planetary boundaries then we might once again have a chance to give young Australians a tilt at establishing their own families, however that might look, and living meaningful lives.

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A photograph of a residential street completely submerged in floodwater. Bare trees stand in the background, and houses with tiled roofs are visible above the water. A white speed limit sign with a red border and the number '50' is partially submerged in the water on the right side of the frame.

POLITICS

Climate Change and the Australian Value of a 'Fair Go'

GREGORY ANDREWS



I spent the first half of November 2023 in a swag on the lawns of Parliament House on a climate hunger strike calling on the Government to do what's needed for a safe future for our kids and country. While focusing primarily on actions to prevent climate collapse, my conversations with the everyday Australians I met often migrated to a quieter and more sinister crisis—a climate reckoning with huge risks for Australia and our peoples. Climate injustice.

While often framed as something affecting developing countries, climate injustice affects Australia too. Indeed, we already have a big and growing problem with inequality. Australians in the top 20 percentile bracket take over 40 per cent of our national income, while those in the bottom 20 percentile only get 6 per cent. Without effective policy responses, climate change will worsen this. And it probably already is.

Climate change deepens inequality by impacting the most those who can least afford it, and by making it harder for those people to rebound from its impacts. Furthermore, powerful figures like Gina Rinehart and Woodside executives are profiting obscenely by exploiting our fossil fuel resources with the support of huge government subsidies. This contributes to the very crisis that is escalating injustice. That's why as we grapple with rising energy costs, food insecurity, floods, heatwaves and bushfires, we must deal with the stark reality of climate injustice. Our climate responses must safeguard the Australian value of a 'fair go'.

For those already facing homelessness, low-quality housing, or the burden of inflation and rising bills, coping with climate extremes becomes an added layer of hardship. Climate change disproportionately increases living costs for low-income earners who spend a much higher share of their income on essentials like food, fuel and accommodation. And that's in addition to the fact that they are already paying a 'poverty premium' on these goods and services. Research by Anglicare, for example, shows low-income Australians pay over 90 per cent more for groceries and 20 per cent more for energy than higher-income Australians.

When conversations pivot to climate action, a focus on ‘techno-fixes’ disregards entrenched systems of disadvantage and injustice that make participating in climate solutions harder for poorer people. Lower-income people are much less able to afford an EV, solar panels or switch from gas to electric appliances, for example. This escalates climate injustice by locking poorer people into more expensive and polluting energy systems and assets.

As an Indigenous Australian, I know that we endure an additional level of climate injustice. Climate change makes it increasingly difficult for us to connect to our country. It’s like being taken away from our religion or identity. Climate change is thus akin to recolonisation; it takes country away from people, and people away from country. The associated ecological and climate grief also adds to our existing mental health pressures.

So, what would it mean for Australia to have social justice and equity at the forefront of climate action? How can we build a climate response that is equitable and effective?

Firstly, we must acknowledge that climate injustice is not an ideological concept but a hard reality. The stories of those of us on the frontlines of climate change need to be heard, understood, and incorporated. It’s not just about numbers and statistics; it’s about people’s lives, homes, and communities. It’s about the impacts of heatwaves on homeless people outside Woolworths and Coles. It’s about the children with asthma in Western Sydney whose health and education are affected by bushfire smoke. Or the kids in Lismore and the Riverina who are homeless due to flooding.

Secondly, our responses must move beyond the technical. While green technology is crucial, we can’t neglect the social structures that perpetuate inequality and are worsened by climate change. We must address the root causes of climate injustice. Aviation and private jet use are a prime example. Private jets have 10 times more CO2 emissions than regular flights per person, and 50 times more than the average train ride. A two-hour flight in a private jet emits almost as much carbon as the average Australian car does in a year. Less than one per cent of the world’s population are responsible for half of global aviation emissions. But four fifths of the world’s population have never flown, and they’re the ones most impacted by the climate crisis.

Thirdly, in Australia we have a unique opportunity to design climate responses based on 65,000 years of Indigenous knowledge about managing this place. Including and listening to Indigenous peoples, and supporting community-led approaches can give Australia a comparative advantage in adapting and responding to climate change that few, if any, other countries in the world can enjoy.

Lastly, it’s crucial to address the glaring injustice of companies and individuals who are amassing obscene wealth by contributing to the climate crisis. Fossil-fuelled profits generated by people like Gina Rinehart and companies like Woodside need to be limited and redirected to sustainable and equitable outcomes. Taxing rather than subsidising fossil fuels can support vulnerable communities, renewable energy transition and adaptation. Australia can learn from Norway in this regard, which is one of the richest countries in the world from its fossil fuels. Unlike Australia which subsidises fossil fuels and inadequately resources its health and education systems, Norway imposes a 78% tax on fossil fuel revenues and pumps this money into free universal education and health care among other things. But in Australia, we subsidise Gina Rinehart to dig up and export fossil fuels tax-free, while excluding our teeth from Medicare and charging university students to become teachers, nurses and scientists. We’d be much better off following Norway’s example and doing the opposite.

The ‘fair go’ must be more than a slogan. It must be a commitment to a society where every Australian has the opportunity to thrive, irrespective of their background. As we face the challenge of climate change, we must cherish that. And we must also hold to account those who enable and profit from the destruction that threatens our social fabric and existence. We must deal with climate injustice.



The White Crow

BY CARL GOPALKRISHNAN

POLITICS

Protecting the People and Places We Love

PROF DAVID KAROLY

A long time ago, David Karoly was a skeptic. Looking closely at the evidence for global average temperatures, David found them unconvincing—“early computer models didn’t account for the cooling effects of emissions from fossil fuels and the signal was largely hidden by the southern oscillation (ENSO) and others”. Two of his earliest papers published in 1987 and 1989 were the first to demonstrate a significant effect in the fingerprint of warming in the atmosphere and cooling in the stratosphere, at which point his skepticism dissolved and he became one of Australia’s most ardent climate champions.

“But that was a long time ago,” says David, “and it means we’ve known about climate change, and done nothing about it, long before the IPCC was set up. The implications for our planet and our children have been willfully and woefully ignored by politicians, government and media, especially in Australia, and it’s still ignored today.”

One thing we need to realise as Australians is that we live on a continental landmass, and while the sea surface temperatures predict warming at one level, we need to realise that temperatures will rise 40–50% faster than predicted by sea surface models. Whilst

these predict a 2.8 degree (Celsius) rise, the reality for Australia is more like 4 degrees, especially inland.

“The good news is that Australia, after years of being a laggard under the coalition, is now on track to limit domestic emissions towards net zero, and this is largely because the current federal government has made changes to the Climate Change Act, supported by state initiatives. At the moment, WA and Queensland are leading the way with up to 43% emissions reductions.”

He cautions, however, that much of the Australian way of life is not just supported by domestic emissions but that coal and gas emissions from exports is roughly double our domestic consumption.

“The Paris Agreement requires developed countries to take the lead. The problem with Australia is that whilst it considers itself a developed country it has acted in the climate space as if it were still developing. We often hear the argument that Australia’s economy should not be compromised by limiting emissions because its competitive advantage relies on fossil fuels and its contribution to global carbon emissions, representing about 1.3%, is so tiny as to register barely a blip. But this disregards Australia’s role as a leader that prides itself on fairness. Australia



Photo by Karsten Würth on Unsplash

represents only .33% of the global population, yet we remain the 14th biggest emitter, one of the highest emitters per person, so our lifestyle has been largely supported by emissions per capita that we would effectively deny to developing nations in a world that must collectively reduce emissions. This is not fair, and certainly not casting Australia as a leader under the Paris Agreement.

Climate change is a compounding factor impacting both the economy and the natural ecology in which it is nested. It's having a vast impact on species loss and we need to go beyond the idea of sustaining our ecology, with more aggressive action focused on ecological restoration.

Restoration is a key theme being embraced by the Wentworth Group of Concerned Scientists, a group of scientists, economists and business leaders advocating for Australia's land, water, and biodiversity. The concept was also recently picked up by a climate change feature by ABC's Behind the News, a children's program in which Gen Z and Alpha are described as 'Generation Restoration'.

As to Australia's nuclear debate, David says we already have the technology.

Fueled by hydrogen, Australia already has a self-regulating power station that relies on nuclear fusion of hydrogen atoms to form helium, emitting vast energy via photons as a byproduct, all without radioactive waste. It's called the 'Sun'.

"There's one key difference," says David. "While power plants on Earth need constant refueling, the Sun has enough hydrogen fuel to keep burning for billions of years to come. It's a truly magnificent natural power station, and we have the technology to harness it!"

Australia has, as Ross Garnaut says, the ability to become a renewables superpower. "We have some of the world's best access to solar and wind energy. But we must carefully manage our distribution systems. We can't sacrifice forests or marine ecologies for our power infrastructure."

Another aspect of Australia's good news is that, along with young people, we have a vast store of Indigenous knowledge spanning sustainable land management for 65,000 years. "Their land management and connection to country has already been tried and tested. It worked for millennia."

"If anything, the hope for the future of Australia resides in the growing empowerment and awareness of its young, allied with the wisdom of its Elders, and the will to harness modern renewable technologies and ways of living within Nature."

Joint winner of the 2007 Nobel Peace Prize and Australia's leading climatologist, Federation Prof David Karoly, gained his PhD in meteorology at the UK's University of Reading. He became Director of the Monash Cooperative Research Centre for Southern Hemisphere Meteorology and later Leader of the Earth Systems and Climate Change hub and was a lead author for the IPCC Working Group 2 on the social impacts of climate change.

A close-up portrait of Penny Sharpe, a woman with short, light-colored hair and blue-rimmed glasses, smiling. She is wearing a dark blazer over a white top. The background is a blurred green foliage.

POLITICS

The Politics of Climate Change

The Hon Penny Sharpe's Fabians AGM Keynote

HAMISH READ

As Penny addressed the national Fabians AGM, the first thing she acknowledged, following the traditional owners of the land, was that action on climate change is urgent and long overdue; that we knew of the problem in Australia as early as 30 years ago. She didn't say as much but this is an indictment on successive governments and generations who have cleaved to business as usual, kicking the can down the road, leaving the herculean task of adaptation so much steeper for younger generations now living.

"We can't ignore climate change anymore," said Penny.

"We have already seen warming above 1.5 degrees; governments are taking action now but we should have started this as far back as 1972."

The 1.5 degree limit was first agreed in Paris in 2015, based on thousands of studies that outlined the worst impacts of climate change beyond this level. For example, the earliest large-scale collection of such studies by Stern and later Garnaut listed, among others, the acidification of the world's oceans, the collapse of the Amazon rainforest, more intense and frequent megafires and weather events, widespread agricultural collapse, climate refugees and resource wars. An analysis of BOM data by Read (2020) found Australia had already surpassed the 1.5 degree limit as the megafires took off in 2020 (see <https://lens.monash.edu/@environment/2020/03/18/1379827/how-much-did-climate-change-cause-the-australian-megafires>). As of April 2024, the European Union's climate agency, Copernicus, said Europe is warming at twice the rate expected and now running 2.3 degrees Celsius above pre-industrial levels, compared to 1.3C higher globally.

In Australia, said Penny, the issue was not taken seriously until the late 1980s. The first serious discussion was led by NSW Labor Senator Graham Richardson in 1989, when federal cabinet first considered reducing greenhouse emissions by 20 per cent by 2005. Had this gone through, Australia would

have been a world-leader in climate equality rather than following the laggardly belligerence of the USA.

"My first reflection in all of this," said Penny, "is that climate adaptation is a wicked problem and the Fabians do love a wicked problem." A wicked problem, a term also used by Ross Garnaut in his series of reports, Penny said is defined from the outset by interlocking issues, often unformulated and amorphous, with confusing interactions and many stakeholders with conflicting interests, conflicting values, and yet having vast implications for the whole system.

Despite early ambitions around 1990, Penny admits that Australia has always been a laggard when it comes to climate change. Former Liberal senator for SA Robert Hill, now a professor of sustainability at the University of Sydney, was a moderate who took the issue seriously. But Howard refused, shutting down anything that might lead to the emissions trading scheme later suggested by Ross Garnaut. Only recently, by the way, Garnaut calculated Australia would be collecting \$70 billion annually had the scheme been adopted. Sadly, the carbon tax went to cabinet in 2003 and was rejected by the Libs, said Penny.

"But Tony Abbot was the biggest hammer blow."

Why does the coalition always fail on this? Penny says it comes down to fundamental values in which they embrace extreme individualism and view collective action with profound suspicion. A few, like Robert Hill, have been willing to deal with it on the moderate end of the Liberal party, but there remains a fundamental skepticism driven by this resistance to collective action.

Says Penny, however, the time for Band-Aid solutions in the current era is well and truly over. Which brings us to more contemporary debate surrounding renewables versus nuclear energy.

Penny says outright that the debate around nuclear is ridiculous.

“Australia’s greatest strengths in terms of its future economy resides in renewables. Driven by the best solar and wind resources on the planet, Australia has competitive advantage in these free energy inputs, and low-cost manufacturing could offer the potential to build and export low-carbon products to completely diversify away from fossil fuels. Further to that, green hydrogen and green steel are not fantasies.”

In NSW, says Penny, 80% of coal-fired electricity is now down to 70% and three of the four main stations will be gone before 2035, probably sooner. Indeed, the biggest coal fire power station, Origin-owned Eraring, is due to close in 2033. Penny says the additional two years will help any reliability gap due to delays in renewables roll-out, and help ease any price spikes.

Answering questions from the floor, Penny addressed the lurking option of nuclear power, which is carbon neutral but hardly clean. She said outright that the nuclear option will take too long, cost too much to build, and nobody will finance it. Nor does anyone want one in their backyard.

Although Dutton might want to focus on immigration, it’s likely the next election will be fought on the issue of nuclear energy. And this opens a whole new level of debate. Says Penny, “If they think arguments around wind farms are hard, just wait for the vitriol surrounding nuclear.”

As we speak, even Origin and AGL are ramping up efforts for a renewables transition, but despite this, the nationals are using nuclear to obfuscate renewables; this, even though their membership is feeling the real effects of climate change on the land.

“We are building thousands of kilometres of transmission lines and the Nationals are willing to tell untruths about this in support of nuclear—that we won’t even need renewables, windfarms and the like, but we will. It’s an outright lie.”

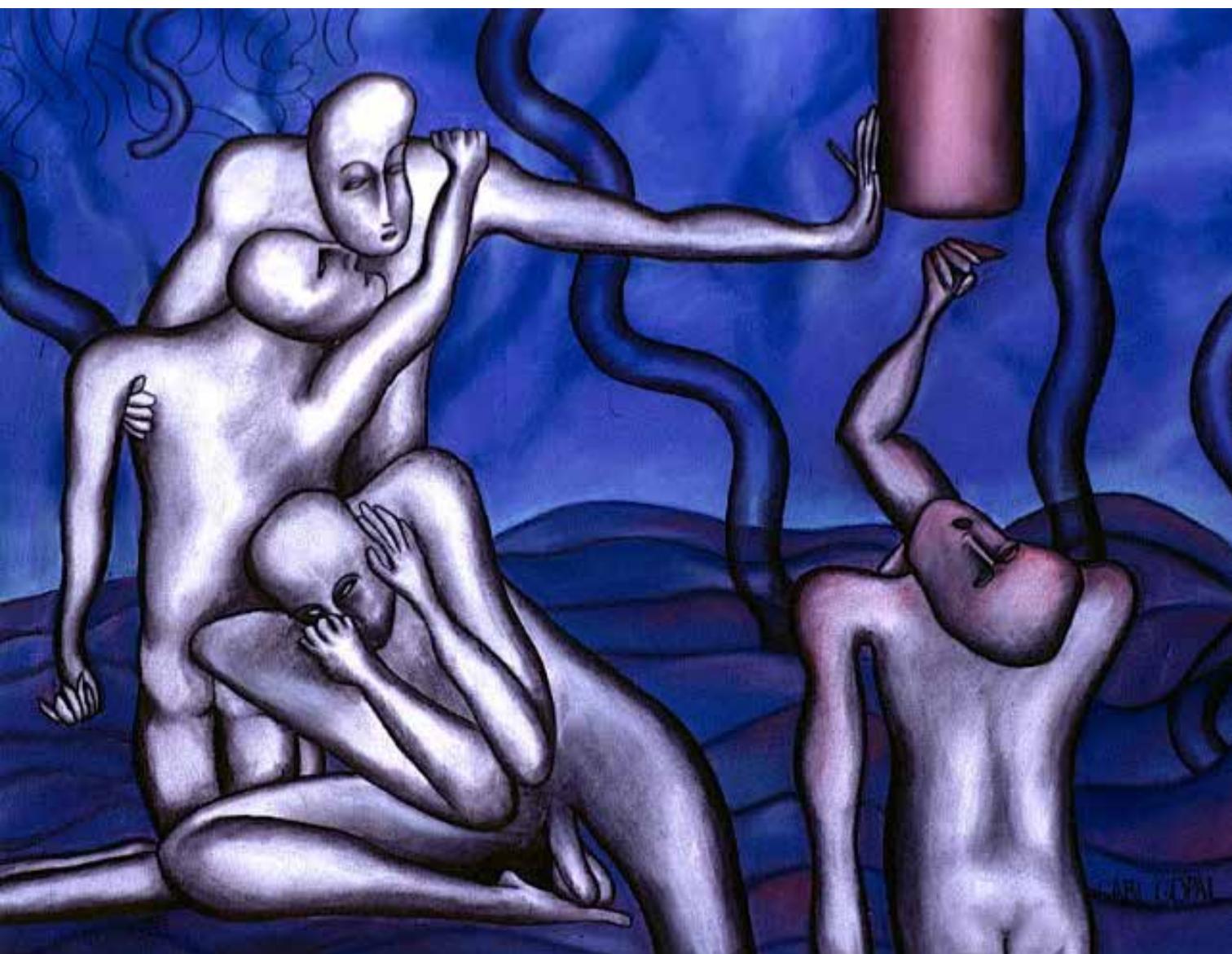
Penny reports that across the central west renewable zone in NSW fully 90% of landholders are now signed up in support of renewables and the infrastructure work is massive.

“There’s lots of good news there that we don’t hear, including jobs growth, future readiness with TAFE, and collaboration with first nations land-holders as well. Sadly, the Nationals don’t stand up for their own communities, and, when spruiking nuclear, they are selling them a lie.”

Meanwhile, by contrast, even the Greens are not as helpful as they could be.

“Although they support our efforts in net zero, perfectionism can be the enemy of the good when it comes to them, and this attitude has long interfered with their support of good initiatives. There was even a point where they were ready to vote against our collective efforts on net zero.”

Recently, Penny recounted, she had the chance to speak with NSW 2023 Scientist of the Year, oceanographer Prof Trevor McDougall. Penny said he spoke beautifully of his career but finished with a short plea. He said that politicians think climate change is a problem to fix but whatever you’re doing is not enough because we don’t have a planet to waste. Penny, reflecting on his words, finished by saying that what keeps her up at night, for as long as she takes responsibility in this chair, is what can be done, and can we do it fast enough?



Ship of Fools

BY CARL GOPALKRISHNAN

POLITICS

Nuclear Power

The health risks we'd face from radiation exposures

DR TONY WEBB

Don't think these would just be from accidents like Harrisburg in USA, Chernobyl then in USSR now in Ukraine, or Fukushima in Japan. Nuclear power plants routinely and always will result in people being exposed to ionising radiation. So do all other stages of the nuclear fuel cycle from uranium mining, through 'enrichment' that increases the level of the fissile part of the uranium (in some cases to a level where it could be used for nuclear weapons); packaging this as fuel rods for nuclear reactors and running these to generate electricity for 30 or so years (and/or sometimes running them to produce even more dangerous plutonium for nuclear weapons), storing and/or 'reprocessing' the 'spent' fuel which involves keeping them under water or air-tight cooled for years before getting round to finding some as yet unproven long term deep underground storage—storage rather than disposal as the sites will need to be protected from human contact for several thousands of years at least.

Collectively and communally quite apart from accidents that have and may yet occur that have exposed large populations across continents, this routine operation of a nuclear fuel cycle will result in significant radiation exposure over time to a large number of people. Communities, particularly those down-wind from any of the mining, milling, enrichment, power/weapons, reprocessing and waste storage facilities, but even more significantly the many men and women who work within these industries who are exposed sometimes on a routine daily basis as part of their jobs.

For all of these people exposed there is a simple important message: the best scientific evidence available tells us that there is no safe level of radiation. Any exposure can be the one that causes damage at cell-tissue level that may result in cells becoming cancerous, or causing other organ damage leading to health effects, and the potential for some genetic defects that can be passed to future generations. This is a hit or miss process—technically known as 'stochastic' damage. Put simply but not over simply, when radiation strikes a cell in the human body one of three things

can occur. The cell is killed outright. This may not be a problem as the body's cells are dying and being replaced all the time. However, if the dose of radiation is high (as happened to nuclear weapons victims in Japan or workers in the Chernobyl accident) and many cells are affected people may experience radiation sickness, whole organs may cease to function and rapid death may result. However, often the radiation passes through the cell without causing damage or the damage caused is slight and repaired by the cell. The long-term health problem may arise when the cell is partly damaged or the repair is inadequate/incomplete and goes on to replicate, in some cases multiplying uncontrollably to show up years later as what we call a cancer.

This picture can be complicated by evidence suggesting cancer may be a two-stage process with initial damage leading to vulnerability and later damage promoting the cancer process. Radiation may be the cause of damage at either stage so people, particularly workers, exposed to other environmental health hazards may be doubly at risk if exposed to radiation as well. It can also be complicated by the type of radiation people are exposed to—broadly speaking Alpha is very intense but has a short range for penetrating the body, Beta is less intense but moderately penetrating, and Gamma which is low intensity but deeply penetrating—rather like x rays which as we know can be used to picture what is going on with bones and some organs inside our bodies. And to add a further wrinkle, the way that each of these interacts with different organs of the body can be less or more damaging. A long-lived alpha emitting radioactive particle that gets trapped in the lung, as happens from breathing radon gas in underground uranium mines (and incidentally other hard rock mines) can significantly increase the risk of lung cancer. There is also evidence for an elevated risk of heart disease and genetic damage when male testes or female ovaries are exposed. More on this later.

Assessing the level of risk—i.e. the probability of a known amount of radiation exposure to a population causing a defined number of cancers

has been a challenge and a source of controversy over the many years since the actual risk of harm was recognised. Various studies on small groups of patients receiving radiation treatment for neck arthritis or scalp ringworm, or survivors of the Hiroshima and Nagasaki atom bomb blasts who received quite high radiation exposures, gave estimates that were used to set international standards for both worker and public annual but not lifetime or collective exposures. A sustained community and trade union-led campaign involving nuclear plant and other radiation exposed workers (in mining, health, industry, public science) that included UK/European, US and Canadian unions through the 1980s focused on mounting evidence that these permitted exposure limits were set way too high and needed to be brought down to a tenth of the levels operating. In the early 1990s this campaign led the international Commission on Radiological Protection to reduce the annual limit for workers (averaged over a five-year period) down to 40% of the previous level, with a similar reduction for permissible public exposures.

The numbers and the measures used for these exposure limits can be confusing so I'll keep it simple with a focus on worker's risks in terms of cancers (later we will look again at other health consequences). The annual limits for exposure are measured in units called Sieverts—or more commonly thousandths of these called milli-Sieverts. The old limit was set at 50 milli-Sieverts (50 mSv). The new limit in 1991 was set at 20 mSv with workers still permitted to receive 50 mSv in any year provided the average over 5 years did not exceed 20 mSv (i.e. they permitted 100 mSv in 5 years of exposure). Unfortunately, these changes fell far short of the evidence available and highlighted advocated by the unions which suggested a limit of 5 mSv a year was appropriate. Since then a major study of nuclear industry workers in Europe has shown that the cancer risks are double those used by the ICRP. In addition the European study shows these worker face a doubling of the risk of heart disease as a result of their exposure working within the current limits. In short, the evidence suggests the limit for workers should be no higher than 5 mSv a year. The same analysis suggests the public exposures need to be kept below 0.5 mSv a year.

But keep in mind these are not 'safe' levels below which health damage will not occur. Wherever the limit is set, this implies that there is an 'acceptable' level of risk that can be met if exposures are kept within these limits. A working rule of thumb

advocated by Canadian authorities when confronted by the Canadian Unions campaign was to compare the acceptable radiation risk with that faced by workers in other hazardous industries. The figure suggested was that 1 death in 10,000 workers a year met this 'acceptable risk' criterion. Leave aside for the moment that some nuclear workers, in uranium mining for instance, were already in a recognised 'hazardous industry', before adding the radiation exposure risk that could have doubled their risk of death from work. I'm not aware of nuclear industry workers ever being made aware let alone agreeing to accept this as a risk from their radiation as a necessary part of their employment. But is this even close to the actual risk of death they face? The currently accepted figure for cancer death risk from radiation that is regularly cited is 4% to 5% per Sievert. How does this translate into an 'acceptable' risk?

Forgive the maths for a moment. The easiest way of understanding the number is to consider a workforce of 1000 people exposed at the current limit to 20 mSv a year for say a working lifetime of 40 years and ask how many of these will die from cancer as a result? Forgive the maths but the total, i.e. lifetime collective exposure of these workers would be $20 \text{ mSv} \times 1000 \text{ workers} \times 40 \text{ years} = 800,000 \text{ mSv}$ or 800 Sv. If the risk estimate is in the range of 4% to 5% per Sievert we can expect 32 to 40 of these 1000 workers to die from radiation induced cancers. This is not 1 in 10,000 a year it is around 1 in 1000 a year—a risk ten times greater than the so called 'acceptable' risk benchmark. Looked at in terms of a lifetime risk for one of the 1000 workers exposed at this limit the cumulative exposure would be 800 mSv. Their exposure would increase their risk of dying from radiation induced cancer by 4%.

Now this is, hopefully, a worst-case scenario—annual exposure to the permitted limit. Radiation protection in the real world requires that exposures be kept below the limit—in fact 'as low as reasonably achievable'. So, if we reasonably expect workers to be exposed below this limit both in any given year and over a lifetime, let's look at actual exposures experienced by at least a significant part of the nuclear workforce. The evidence suggests that: uranium miners, some of the more directly exposed nuclear power and reprocessing workforce and workers in the proposed nuclear waste management industry can routinely expect an annual average exposure figure of around 1–5 mSv a year—one twentieth to a quarter of the upper limit. If we also consider a working lifetime exposure limited to,

say, 20 rather than 40 years' work in high exposure areas, the cumulative exposure of a workforce of 1000—again excuse the maths—falls into the range of becomes $1-5 \text{ mSv} \times 1000 \text{ workers} \times 20 \text{ years} = 20,000 \text{ to } 100,000 \text{ mSv}$ or 20 to 100 Sv. If we accept the latest evidence on cancer risk from the European workers study workers can expect an increase in fatal cancers at 8–10 % per Sievert. For our group of 1000 workers this translates to a probability that between 2 and 10 workers will die of radiation induced cancers in their 20-year radiation-exposed working lifetime.

Now add to this the evidence of doubling the risk of heart disease in European Nuclear workers and add on the risk of genetic damage being passed to children—a level of risk still much contested but accepted as an additional risk to people exposed. Consider not just workers who, arguably, might accept these risks as the price to be paid for their employment, but the much larger wider population who will be, often unwittingly, exposed and we have an inevitable and potentially considerable collective and cumulative exposure with unavoidable health risks from radiation exposure from the nuclear industry. As indicated above, despite regulations exposing limits on these exposures the risks may be unacceptable for many of workers in the industry—and by extension so may be the risks from radiation exposure of the public.

To put it bluntly—would you accept a job in the industry when you could be permitted to face a 1 to 4% risk of dying from radiation induced cancer with a likelihood that, even with best practices operating to keep your exposure as low as reasonably achievable, your increased cancer risk could still be of the order of 1-4% higher than you might expect? If so it might be a good idea to have this acknowledged in your employment contract—that way it might make it easier to claim compensation if the worst occurs and you do contract cancer perhaps 20 years after the exposure.

These risks to worker and public health need to be weighed in the debate about whether we should consider expanding our involvement in the nuclear industries as part of our attempt to manage the existential climate change crisis by replacing our reliance on coal oil and gas with nuclear power plants. They also weigh heavily on the decision to base much of our future defence on an as yet undeveloped capacity to manage nuclear powered submarines—the proposed US/UK (AUKUS) alliance version of which will be based on highly enriched, i.e. weapons grade nuclear fuel.

But the lack of appreciation of the true scale of risk from low-level radiation exposure has significant consequences outside of the nuclear industry. Back in the 1990s diagnostic radiology, use of x-rays taken to investigate possible health problems, was making a significant contribution to the collective annual radiation exposure of the population. Since then, even though modern equipment delivers lower doses per scan, the number of scans has increased and as a result the collective exposure to the populations from this diagnostic radiation exposure has risen by a factor of five. Using the estimates of the risk outlined above suggests that in a country the size of Australia we are likely causing between 2000 and 4000 radiation-induced cancers a year—all of which will of course be ‘invisible’ and unattributable to radiation within the overall cancer rates. This is not to suggest that all or even many of these X-rays are unnecessary but some are, and are undertaken in a context where many of the medical staff authorising them and radiographers administering them are unaware of the scale of the potential collective risk. Even though the risk to the individual from a single procedure may be small and outweighed by the benefits, It can be useful to ask physicians a series of questions before agreeing to the procedures including: What will the x-ray show that you don't know already? What will you do differently as a result of having this x-ray? What measures will you ensure are used to reduce unnecessary exposure and exposure from scatter outside the target x-ray photo zone? It is disturbing that many radiographers do not routinely offer shielding—for example to protect neck/thyroid and gonad/pelvic areas when taking chest x-rays. And for those who dismiss concerns using the argument that the risk from an individual scan is small and “we'll just take one to be on the safe side” it can be useful to point out that the physician or radiographer is usually ‘on the safe side’—behind a screen—the patient is not and the health effects from radiation are stochastic / hit-and-miss at the level of cell damage—to be avoided unless necessary.

Raising awareness of the evidence for health risks from radiation is key to improving health of workers and the public, and changing cultural attitudes, as well as countering the facile and misleading arguments of those who would offer nuclear power as a solution to the carbon-polluting climate energy crisis.

POEM

The Gilded Throne of Capitalism

ROGER CHAO

I drove through a dust-bitten stretch of America where the billboards flicker and sag,
Old campaign signs bleach under decades of sunlight, rusted through at the jag.
And I saw a man in a service station hat, sipping coffee thick as mud and twice as burnt,
Said, "You headed past the Strip Mall Mausoleum? That's where he used to rant and blurt."

I didn't know what he meant, so he waved toward a crumbled steel façade,
"Once was a golden tower here, now it's just memory soaked in pomade."

I parked by a pile of marble that had cracked like a porcelain plate,
Twisted letters in gaudy gold spelled "TRU" and nothing past that fate.
There were boots in the lobby, military shine, but no legs to fill their place,

Just pigeons crapping on velvet ropes and silence empty like a case.
A hand, sculpted once in bronze, stuck out of weeds with two fingers up,
Half peace, half something else, maybe asking for one last cup.

The sky was clear but tired, and the wind had a dry, sarcastic tone,
Like it had seen empires come and fall, and was ready to move on alone.

And there in the centre, cracked but still absurdly huge in size,
A bust stared up from the dirt with bleached-out teeth and empty eyes.
You could tell it once had grandeur, a likeness moulded with care and gold,
A jaw clenched like it could grind history, a gaze that aimed to control.

On a plaque, nearly covered in dust and lichen that time had sown,
Were carved the words in faded caps:

"I BUILT THE WALL. I STOOD ALONE.

I OWNED THE SKY, THE TOWER, THE THRONE.

I SPOKE, AND NATIONS TREMBLED TO OBEY.

I MADE AMERICA MINE, THEN WALKED AWAY."

Nothing else remained but the bones of ambition in an empty field,
A golf cart rusting in the sand, secrets the documents never revealed.
No crowds now to chant or cheer, just shadows stretched across the tar,
No cameras, no spotlights, only the truth of who we really are.
There were echoes in the escalators that once gleamed with mirrored pride,

Now shattered glass and lolly wrappers where the future came to slide.
 A voice recording still clicked on from a buried loudspeaker in loops,
 But the words were scrambled, barely more than babbling corporate whoops.

This was a kingdom built on ratings, retweets, and marble gold veneers,
 All glitter and no gospel, puffed up to smother fear.
 For a while, the stage held firm, and the crowd drank every word and wink,
 But towers built on slogans tend to crumble faster than you think.
 The hand of time does not applaud; it sweeps, it scrapes, it strips,
 No matter how high your name is hung, the ladder always slips.
 And here, in this desert of forgotten chants and plastic flags half-torn,
 Lies the truth beneath the hair and heat: even loud gods get reborn...
 ...as relics, as memes, as lessons half-taught in a system half-awake,
 With monuments that rot like statues built from icing on a cake.

One man, he told me, tried to paint the world in his reflection's glow,
 But the mirror broke and left behind only what the world should know:
 That power never lasts in hands that clench too tight or build on fear,
 That every chant will fade to hush, and every empire disappears.
 I asked a local teen what this place was, she shrugged and said, "Some guy.
 My grandpa said he shouted stuff. He built a thing. He lied."
 The irony was hard and dry, like soda left uncapped and flat,
 That something built so loud and large could end up only that.
 A whisper. A ruin. A laugh without a joke. A tie too wide to wear.
 A ghost in a suit of confidence, puffed up with dollar air.
 And yet, I felt a pang of awe, not for the man but for the fall,
 How ego dressed in diamonds can still answer nature's call.
 The desert didn't flinch. The weeds didn't know his name.
 They climbed the broken statues just the same.

This is what he left: a crater where applause once fanned the flame,
 A gilded mask, a fossil stamped with fame.
 And maybe that's the lesson buried under pride and fake gold leaf,
 That power built on spectacle will always rot beneath belief.
 I saw a bird nest in a MAGA hat that crowned the tilted dome,
 A small thing claiming shelter in a place once called a throne.
 The irony was thick as cream, the stage now held the script,
 Of how even titans with a Twitter grip can find the power slipped.
 A businessperson, a brand, a bluff dressed up in empire tone,
 Now dust, now glass, now left alone.

A voice that claimed eternity in one last perfect tweet,
 Now swallowed by the silence of his own defeat.
 There's something deeply honest in how this place forgets,
 It doesn't matter how you posed, or how much gold you get.
 The wind keeps blowing. The wires rust. The marble eats the rain.
 No legacy survives that feeds on fear or profits from disdain.
 And so I left the ruin there, a caution blinking in the sun,
 Of what becomes of kingdoms built on ratings and a gun.
 No judge, no gavel, no final trial, just erosion's soft command,
 That even gods of television fade into the sand.
 And still that hand remains, two fingers frozen in the air,
 Half peace, half plea, half dare.

And somewhere far, a screen still loops the speeches, edits tight,
 But no one's watching now, they've turned off the light.



Photo by Curioso Photography from Pexels
www.pexels.com/photo/aerial-view-of-dry-cracked-ground-4374747/



Supernature

BY CARL GOPALKRISHNAN



CLIMATE

Convergence

Convergence of life sciences, physical sciences, engineering, and beyond is critically needed in developing carbon removal solutions

PROF ANNALISA BRACCO

CONTEXT: Prof Bracco says we need \$1 trillion US invested globally in a multi-country and multi-sector effort to achieve carbon dioxide removal (CDR) technologies that draw 10 gigatonnes of carbon out of the atmosphere every year by 2050. Otherwise, we will fail the Paris Agreement. For context, Australia's superannuates alone could do this twice over. So could the US Defense budget for 2024 at \$2.08 trillion. Or consider that Australia alone generates \$62 trillion of GDP per year. Spread across 194 UN nations, the CDR investment is surely not an impossible task. For more context, consider Forbes' World's Billionaires List 2024, where the top 10 richest individuals have a combined net worth more than \$1 trillion US. They could literally save the Planet.

From mid-March 2023, monthly averaged surface ocean temperatures have broken new warming records compared to all previous measures since 1979, when satellite monitoring started.

Meanwhile, in 2023 carbon dioxide (CO_2) emissions reached a new high surpassing 37 billion tonnes (Gt). At these levels of energy needs, carbon neutrality cannot be achieved through green energy alone. While grid modernization and clean energy development is, and must remain, a vital step towards sustainability, carbon dioxide removal (CDR) technologies need to be deployed to keep global temperatures from increasing above 20°C .

These technologies remove CO_2 leveraging either natural or engineered systems. Examples of CDR range from capturing carbon in the atmosphere through direct air capture to planting trees on deforested lands, restoring coastal ecosystems, and adding alkaline substances to fertilizers used in agriculture or seawater to accelerate the land and ocean natural carbon sink.

CDR must capture 10 Gt of CO_2 per year by 2050 for carbon neutrality to become a reality by the end of this century. To achieve this target, we need to develop a new technology sector that is roughly worth \$1 trillion. This industry is being built, as we speak, with limited input from the science community.

Some of the proposed CDR technologies are speculative because their environmental or social impacts are probably unacceptable; for others there are questions about their effectiveness or cost. Another critical question is what role CDR can play from a policy, economic and climate justice point of view, and finally what may be legal.

Several CDR approaches aim to draw down atmospheric CO_2 by mimicking and accelerating

natural carbon fluxes. Limited understanding of the climate-carbon feedback and large uncertainties in key terms that describe the evolution of these carbon fluxes hamper both the trust in climate prediction and the public support for large-scale efforts to mitigate climate change through CDR.

As an ocean and climate scientist, I argue that we must quickly converge disciplinary excellence in basic and applied sciences and engineering, and bring together computer scientists, social scientists, lawyers and economists, together with a broad international network of foundations and private and public partners. We need to create an innovative ecosystem and build a new, more diverse and transdisciplinary workforce capable of addressing the climate challenge. That very workforce will also fuel the industry we need to build. This convergence of basic and applied sciences is both urgent and critical: currently the development of engineered solutions to the climate challenge is led mostly by engineers, but technologies that include the environment within their system boundary require extensive collaboration among engineering and natural science researchers, as well as social scientists to achieve public acceptance, lawyers to develop a legal framework, and economists to evaluate costs and benefits.

We should prioritise *understanding* of carbon exchange processes in the ocean/atmosphere reservoirs and of the stability of the fluxes across those reservoirs under different levels of warming; *advancing biogeochemical modeling* through a hierarchy of earth system models, and by building new modules that adopt state-of-the-art tools from machine learning and artificial intelligence; *improving and innovating CDR approaches*; and finally, *assessing the impacts of CDR solutions* by incorporating the key dynamics into earth system models and carefully investigating ethical, economic, legal, regulatory constraints and public perception.

This effort—that no university, government or private company can take up alone—must be shared across continents and feed seamlessly into educating a more diverse and inclusive workforce, broadening participation in the scientific endeavor and fostering a more ethical knowledge transfer of both science and technology across disciplinary and political borders (and barriers).

A Minsky Moment

Why embracing post growth is the only answer

KASPER BENJAMIN REIMER BJØRKS Kov
EDITED BY ALEX IANCHENKO AND JULIANA AGUIAR RODRIGUES

In a world where the relentless pursuit of growth has led us to the brink of ecological collapse, it is needed to rethink our economic models. Mainstream economists, entrenched in their dogmatic adherence to growth-at-all-costs ideologies, are failing us spectacularly. Their unwavering faith in perpetual economic expansion blinds them to the glaring empirical evidence of our planet's finite resources and the ecological limits we have already breached. These outdated paradigms, championing short-term gains over long-term sustainability, lead us down a path of environmental degradation and social inequity.

With six (now seven, Ed.) of nine planetary boundaries already breached¹, we are staring into the abyss of ecological collapse. Our Earth, our home, is gasping for breath, suffocated by the relentless pursuit of profit. No EU country meets the needs of its residents within ecological limits², and there is no empirical evidence of decoupling emissions from economic growth at the required speed and scale³. In this post-growth world, we must urgently reimagine our investments to prioritize social and ecological impact over profit if we are to secure a future worth living.

Facing the economic realities of climate change

Ignoring the post-growth reality is a gamble for businesses. Climate change threatens to cost institutional investors a staggering \$25 trillion on real estate investments over the next 25 years⁴. Our global economy is on track for a 19% reduction in income by 2049, regardless of future emission decisions⁵. Mitigating these effects and limiting global warming to 2°C is six times less costly than the projected damages. A 1°C increase in global temperatures results in a 12% decrease in world GDP, and the financial repercussions from extreme climate events are expected to escalate dramatically. The conclusion is unequivocal: unilateral decarbonization benefits both the planet and the economy. Taking proactive steps now is crucial to securing a sustainable and prosperous future.

The illusion of technocratic solutions

Relying on technocratic adjustments, such as price mechanisms and technical change, is akin to placing our faith in an illusion. These solutions

demand the deployment of highly speculative negative emissions technologies⁶, a gamble described by economist Jason Hickel as

“Jumping off a cliff while hoping someone at the bottom will figure out how to build a device to catch you before you crash into the rocks below.”

This stark analogy highlights the problem of clinging to outdated economic paradigms.

The role of business in the transition

Businesses must integrate degrowth and post-growth principles into their strategies. This means identifying and protecting transitional assets, building new forms of value, and discarding practices that no longer serve society. This reorientation around limits to growth is not merely a moral imperative but a strategic necessity.

To future-proof investments, businesses must prioritize companies that focus on social and ecological impact over profit. This shift is essential, as ignoring climate change and inequality could lead to a 50% reduction in GDP according to a recent paper published by the University of Exeter⁷, collapsing the very system on which the elite rely.

Degrowth by force—manifesting as decay and destruction—leads to economic and financial system collapse. In contrast, degrowth by design offers a ‘third way’ that transcends the growth vs. no-growth dualism.

A vision for a new economy

Degrowth by design means reducing high-income countries’ excessive energy and material use from one that drives climate change and environmental degradation while basic needs like housing, healthcare, and nutrition often go unmet. To tackle this dual challenge, a new economic approach is essential. We must urgently deconstruct monopolies, decommodify essential goods, democratize production, and redistribute wealth. High-income countries must reduce non-essential production and consumption to lower environmental impacts and accelerate decarbonization⁸. This approach involves a different understanding of ‘love for all life’, balancing environmental capacity with human wellbeing. It requires rethinking bioregions, collaboration and governance structures that prioritize life.

We must understand that the ultimate goal of business must shift from profit maximization to prioritizing social and ecological well-being. Wealth inequality persists because our current system

enforces wage stagnation and wealth accumulation by a few business owners. To deliver profits to their owners, businesses must constantly sell more, relying on advertising, planned obsolescence, and poor product design to persuade consumers to purchase unnecessary items. This relentless drive for growth perpetuates a cycle of overconsumption and environmental degradation.

The absurdity of the current system becomes evident when we consider the fact that overproduction and overconsumption have entrenched themselves as systemic issues, leading to a multitude of alarming consequences. From 2016 to 2021, we globally consumed over 75% of what we did throughout the entire 20th century⁹. Since 1970, the global population has doubled, yet resource extraction has tripled¹⁰.

The extraction of raw materials is projected to increase by 60%, reaching 167 billion metric tons by 2060¹¹. Humans are now using 1.7 times the amount of Earth’s resources¹². High-income countries are responsible for 74% of global excess resource use from 1970 to 2017¹³, and the United Nations has highlighted that overconsumption in high-income countries is causing severe environmental damage to children globally¹⁴. Despite this overconsumption, research teaches us that consumption does not enhance personal well-being and may, in fact, contribute to decreased happiness¹⁵.

Our overconsuming lifestyle is based on the exploitation of low-emitting nations; therefore, ending colonialism is vital for addressing global inequality and ensuring an equitable transition towards a new economy. Currently, the Global South subsidizes the development of the Global North. According to a peer-reviewed study, the Global North annually extracts value equivalent to \$2.2 trillion from the Global South. For every dollar provided by the Global North in investment and aid, the Global South incurs a loss of \$30. From 1990 to 2015, the drain from the Global South through unequal exchange was equivalent to a quarter of the Northern GDP¹⁶.

We must strive for a more equitable global economy that does not rely on imperialist appropriation. Addressing these deep-seated issues is crucial for creating a sustainable and just future for all.

We must transition our economy from monetary-based goals to public health goals, aiming to create a healthy society that ensures high levels of public health. This includes maintaining a healthy ecosystem and a safe habitat for all living beings, as we cannot

have healthy people without a healthy planet. To achieve this, we need to shift support from ‘for-profit’ companies to non-profit organizations by redistributing profit and wealth.

Additionally, we must redirect pension funds from the stock market into green and social bonds, investing in the real economy that fosters a post-growth world. By making these changes, we can create a sustainable and equitable future where businesses serve the greater good and contribute to the well-being of people and the planet.

We need to rebuild our financial sector to serve life rather than finance. The growth-based economy actively endorses a trajectory toward ecological and social turmoil. Once in overshoot, the planet’s sustainable carrying capacity can only be re-established through managed decline or collapse. Businesses, banks and investors must recognize that the post-growth economy is inevitable and integrate its principles into their strategies.

Embracing sufficiency requires us to challenge deeply ingrained societal norms that equate more with better. It necessitates a cultural shift towards valuing quality over quantity, well-being over consumption, and long-term sustainability over short-term profits. This paradigm shift is not only morally imperative but also economically rational. By reducing our dependence on finite resources, we are less vulnerable to resource scarcity and price volatility.

Those who mock and misrepresent the sufficiency debate retreat from a conversation they can no longer win as the empirical evidence mounts against them. These discussions, published in leading journals and held at conferences like Beyond Growth, are pivotal to our future. They provide a robust scientific foundation for rethinking our economic goals and adopting policies that prioritize ecological balance and social equity.

Most people intuitively understand the basics of sufficiency, highlighted by the famous meme:

For people living in poverty, ‘enough’ can also mean ‘more.’

The power of sufficiency

Yes, there is hope. We can meet human needs with significantly lower energy use in the Global North¹⁷. A good life for all within planetary boundaries is possible, but it requires a profound shift towards sufficiency, equity, and eco-social policies. This shift means countering inequality measures, challenging entrenched interests, and dismantling climate-delay discourses.

Sufficiency—meaning “enough”—is not merely a strategy but a revolutionary concept that can counteract ecological overshoot and eradicate unmet needs. The German Advisory Council on the Environment poignantly notes that:

“For people living in poverty, ‘enough’ can also mean ‘more.’”

Global justice demands sufficiency to end imperialist appropriation and unequal exchange relations. Sufficiency involves curbing excessive demand for energy, materials, land, and water, offering the least risky path to reducing geopolitical tensions, resource conflicts, and militarization¹⁸.

“If a monkey hoarded more bananas than it could eat, while most of the other monkeys starved, scientists would try to figure out what’s wrong, when humans do it we put them on cover of Forbes.”

We must recognize the futility of endless consumption and the profound satisfaction that comes from meeting our needs in harmony with the planet’s limits. The concept of “enough” resonates with a fundamental human sense of balance and justice. By aligning our economic practices with this principle, we can foster a more resilient, equitable, and sustainable world. Sufficiency means recognizing that the economy should never overshoot biocapacity nor undershoot decent living standards.

Embracing degrowth

Science tells us that degrowth is not a choice but an inevitability¹⁹. We can opt for a deliberate, democratic reduction of economic activity or face unplanned, disastrous contraction. Degrowth and post-growth perspectives offer a vision of a new economy that businesses must embrace to adapt and thrive.

Ignoring these realities risks catastrophic economic collapse.

Our financial system must grasp that money is a claim on finite energy and resources. As these resources deplete, financial collapse looms. Today, gains are privatized, and losses are socialized, making it nearly impossible to prioritize social and ecological impact over financial returns.

A post-growth economy is inevitable, and the businesses that will thrive are those still essential when the money stream dries up.

Embracing the post-growth compass

“In the land of the blind, the one-eyed man is king” Desiderius Erasmus

In the world of business, foresight is essential. The ability to predict market trends isn’t just useful; it’s crucial for long-term success. The precarious truth is that we actually do know what lies ahead: the science is unequivocally clear. A post-growth economy is inevitable when money is tied to finite resources. This understanding offers us a compass—post-growth and degrowth principles—that can guide us toward steering money in the direction that is not only needed but also financially prudent.

Imagine if Nokia had foreseen the revolutionary impact of Apple’s iPhone release. They could have pivoted, innovated, and remained a dominant force in the mobile industry. Similarly, understanding the impending shift to a post-growth economy enables companies to make the most financially beneficial business decisions today by prioritizing investments that emphasize social and ecological impact over mere profit. This isn’t just the right thing to do; it’s the financially smartest thing to do, since there is no business to do on a dead planet.

We’re moving from a life of abundance to a life of constraints. In this new reality, only businesses that focus on social and environmental responsibility will not only survive but thrive. As resources become scarcer, the companies that prioritize sustainability and ethical practices will be the ones to flourish. In a post-growth world where limits are enforced, our collective survival depends on restoring the planet and ensuring the well-being of all. These responsible companies are the only ones we can afford to support. We must therefore collectively understand that degrowth and post-growth principles are essential. Since investments that focus on regeneration, resilience, and equity will yield long-term benefits and be better positioned to navigate the risks associated

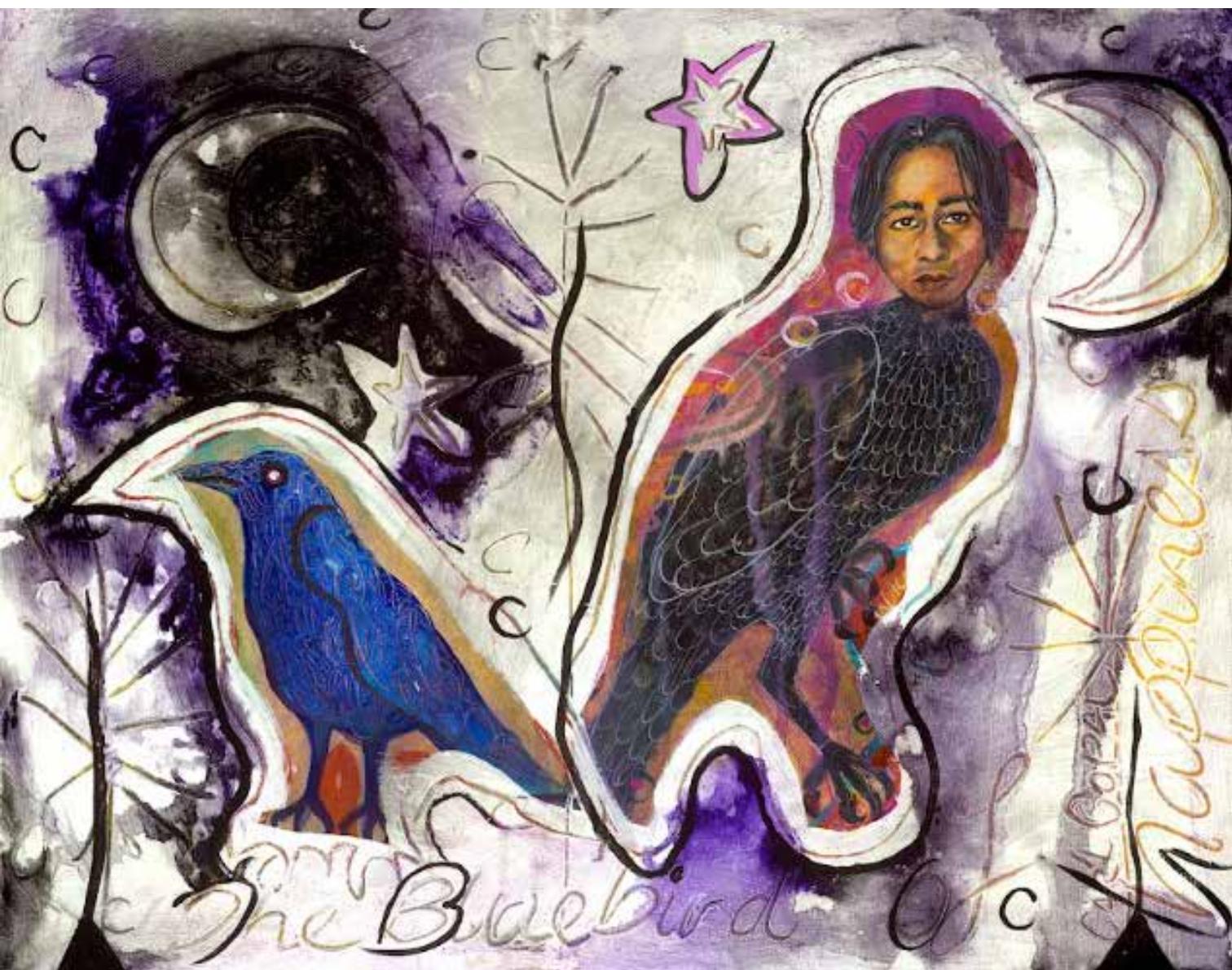
with climate change, resource scarcity, and shifting consumer preferences. As the world transitions to a post-growth economy, these companies will be the only ones that survive.

Because in a world where finite resources dictate economic realities, the post-growth and degrowth principles offer us a compass to navigate the future. By understanding and embracing these principles, the financial sector can make decisions that are not only right for the planet but also smart for business. All investment now must now mitigate and regenerate at the same time, therefore prioritizing social and ecological impact over profit is the key to futureproofing our investments and ensuring a prosperous, sustainable future for all.

Let us steer our financial strategies with this new compass, embracing the transformative change needed to build a resilient, equitable, and sustainable world. Together, we can build a future where businesses of the future serve both people and the planet.

Endnotes

- 1 [Earth beyond six of nine planetary boundaries | Science Advances](#)
- 2 [How close are European countries to the doughnut-shaped safe and just space? Evidence from 26 EU countries | ScienceDirect](#)
- 3 [Is green growth happening? An empirical analysis of achieved versus Paris-compliant CO2-GDP decoupling in high-income countries | The Lancet Planetary Health](#)
- 4 [The next housing disaster | Apr 13th 2024 | The Economist](#)
- 5 [The economic commitment of climate change | Nature](#)
- 6 [Full article: A factor of two: how the mitigation plans of 'climate progressive' nations fall far short of Paris-compliant pathways \(tandfonline.com\)](#)
- 7 [the-emperor-s-new-climate-scenarios_ifoa_23.pdf \(actuaries.org.uk\)](#)
- 8 [A Degrowth Economy Explained | Explore degrowth](#)
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- 10 [UN calls for urgent rethink as resource use skyrockets \(unep.org\)](#)
- 11 [Global Material Resources Outlook to 2060: Economic Drivers and Environmental Consequences | READ online \(oecd-ilibrary.org\)](#)
- 12 [We would need 1.7 Earths to make our consumption sustainable | Washington Post – Earth Overshoot Day \(footprintnetwork.org\)](#)
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Bluebird of Happiness

BY CARL GOPALKRISHNAN

CLIMATE

Climate Crisis

Mitigation, adaptation and regenerative co-evolution—the past five years

DR JENNIFER M GIDLEY

Abstract

In this paper I explore the current scientific research on climate change including issues related to mitigation, adaptation and regenerative co-evolution, and look at where we need to go to turn things around. I also discuss the recent US-lead Climate Summit and to what extent the Summit will help. I include some key regenerative innovations and initiatives, with promising examples.

The rising awareness of climate crisis

It is now widely accepted among scientific and other research circles that the complex issue of anthropogenic climate change endangers our entire civilizational futures as it tracks a path to radical, rapid, and potentially irreversible changes in the global ecosystem in the relatively near-term future—within a century. Climate scientists are in agreement about several critical impacts:

- That a warming planet increases risk for large numbers of the global population;
- That we must keep the warming below 2 degrees Celsius, to avoid catastrophe;
- That global warming results from the industrialized human lifestyle;
- That runaway climate change is potentially irreversible.

I accept the science that argues this change is anthropogenic. I am deeply concerned that the changes projected will increase risk for large swathes of the global population and that this is potentially irreversible, unless humanity takes drastic, immediate action. In the foreseeable future the rapid melting of polar glaciers and sea ice will significantly raise sea levels, inundating many small island states, low-lying countries, and large coastal megacities. This will drive mass migration on a scale not seen for 10,000 years.

Almost thirty years ago, there was already

sufficient concern at the Earth Summit in Rio in 1992, that the UN Framework Convention on Climate Change (UNFCCC) was agreed on and signed. In this agreement it was formally acknowledged by 154 signatory countries that anthropogenic climate change was already well underway. The current number of signatories in 2021 is 197. Thirty-six of these original signatories, plus the EU, were required under the Kyoto Protocol signed in 1997 in Japan to achieve greenhouse gas emission levels specified for each of them in the treaty. These were mostly developed countries (belonging to the OECD), expected to do more to reduce emissions.

In 2008 the IPCC Chair, Rajendra K. Pachauri, deplored the lack of adequate attention and action that has occurred despite the 1992 agreement, noting greenhouse gas (GHG) emissions had increased by a startling 70% between 1970 and 2004. Then seven years ago the IPCC 5th Assessment Report (2014) stated: “Human influence on the climate system is clear, and recent anthropogenic emissions of greenhouse gases are the highest in history.”

The United Nations Global Assessment Report on Disaster Risk Reduction (2015) reported that floods, storms and other extreme weather events have killed 606,000 people since 1995. Oxfam reported in 2020 that extreme weather has displaced 20 million people per year in the last decade:

“Climate-fuelled disasters were the number one driver of internal displacement over the last decade—forcing an estimated 20 million people a year from their homes... [80%] live in Asia, home to over a third of the world’s poorest people.”

The UN World Meteorological Organization told us in November 2020 that Greenhouse Gas emissions (GHGs) continued to break records every year, in spite of a small reduction in 2020 related to COVID shutdowns: “Since 1990, there has been a 45% increase in total radiative forcing—the warming effect on the climate—by long-lived greenhouse gases, with CO2 accounting for four fifths of this.”

However, in spite of the weight of scientific evidence, the politics of climate change is not so clear, with some in political and business circles still denying that climate change is happening, while others accept climate is changing but claim it is part of natural cycles. In the domain of big oil and coal, there are even more sinister issues in train. The publication in 2015 of an email from oil giant Exxon Mobil’s in-house climate expert, Lenny Bernstein, revealed that Exxon both knew about climate change as early as 1981 and spent millions funding “climate change deniers” for almost thirty years.

Mitigation and adaptation

There are two main strands of work undertaken in the broad area of climate futures: climate mitigation, which is largely a global issue, and climate adaptation, which is largely a local issue. I will first look at some key components of mitigation, focusing on the two main approaches: reducing greenhouse emissions, and carbon capture. Then I will look at two kinds of adaptation: passive adaptation and active co-adaptation. The latter refers to co-evolutionary community adaptation through social learning, which enables small-scale, bottom-up mitigation, through restorative and regenerative practices.

Mitigation: from emissions reduction to carbon capture

Climate change mitigation involves research, design and implementation of strategies that will slow, and preferably reverse, the current unsustainable climate trends, particularly global warming. The seriousness with which mitigation needs to be tackled on a global scale can be summed up in the following statement from IPCC 2014.

“Without additional mitigation efforts beyond those in place today, and even with adaptation, warming by the end of the 21st century will lead to high to very high risk of severe, wide-spread and irreversible impacts globally (high confidence).”

The single most powerful strategy for mitigation is the global reduction of greenhouse gas (GHG) emissions across various sectors—energy, transport, building, industry, agriculture, forestry and waste. While much of the effort to reduce GHG emissions focuses on industrial and household emissions, a UNDP Report noted how changing land use patterns in the developing world “drives carbon flows into the atmosphere [with] tropical deforestation as a major source of rising carbon emissions [especially] in the Brazilian Amazon—the largest area of tropical forests in the world.”

The latest mitigation thinking is that reducing GHGs is vital, but not enough to prevent the worse case scenarios of climate crisis. We also need to focus on carbon capture or carbon sequestration. In addition to reducing deforestation, we need to plant billions more trees. A great example is the Great Green Wall of Africa project. Other newly emerging means of carbon capture include regenerative agriculture, and restorative and regenerative Ocean farming involving growing kelp, seagrasses and mangroves. They provide the means to connect

global mitigation strategies with local and regional co-adaptation strategies. We will discuss these below under regenerative co-evolution.

Adaptation: from passive adaptation to active co-evolution

In contrast to mitigation, which must be tackled on a cooperative global scale, because of the global nature of anthropogenic climate change, adaptation relates more to the local and regional effects of this global challenge.

The IPCC argues there are limits to the effectiveness of adaptation, especially with greater magnitudes and rates of climate change. Even if the best possible scenarios for reduction and stabilization of GHGs, as recommended by the UNFCCC, were achieved, projected climate change events would still require significant adaptation.

It is widely believed by many climate scientists today that neither mitigation, at the levels currently operating, nor passive adaptation, which is “fitting into” predetermined conditions will be enough to prevent some of the most dire environmental and human catastrophes in the coming decades. What we need to do is to co-adapt or co-evolve, meaning to “make suitable”, whereby a more active two-way interaction is possible.

This active adaptation or co-creation evokes human agency. We humans are the ones who created this catastrophe. We are the only ones who can lead us out of it.

Why we need regenerative co-evolution in climate futures

Until the important Paris Agreement was signed in 2016, most nations were not prepared to commit to anything like the targets that have been recommended. Perhaps the most important aspect of the Paris Agreement is encapsulated in the following statement.

“The Paris Agreement’s central aim is to strengthen the global response to the threat of climate change by keeping global temperature rise this century well below 2 degrees Celsius above pre-industrial levels and to pursue efforts to limit the temperature increase even further to 1.5 degrees Celsius.”

The gap between the ambition of the Paris Agreement to limit warming to 1.5 and the actual commitments made by nations so far, points to a trajectory of temperature increases in the range of 3 degrees Celsius above pre-industrial levels,

which would be catastrophic. As summarized by Jill Duggan, Executive Director of the Environmental Defence Fund (EDF) Europe, in her comments after the 2021 US-Lead Climate Summit:

“Temperature increases of around 3 degrees ... may not sound like much, but these small average temperature increases will be truly catastrophic—causing widespread droughts, flooding, mass migrations, water shortages, species loss and the proliferation of invasive species.”

Not to mention the demise of the vast Ocean, already at a tipping-point, in terms of heating, acidification, loss of species and bleaching to the death of coral reefs. We need to urgently switch from old energy systems using GHG-emitting fossil fuels, to renewable energies, and dramatically increase carbon capture strategies to prevent the most catastrophic effects of global warming.

We need to take a much longer-term view of our environmental and ecological systems, which are tipping towards ecosystem collapse. We need to re-invent, re-create, and regenerate all our ecological systems so they are not extractive, or even merely sustainable, but restorative and regenerative both on land and in the ocean.

The climate summit under Joe Biden

The US-government-lead Climate Summit in April 2021, under President Biden, was the first chance to bring the US back to the Climate Table after four years of US denialism. The Summit, which brought together 40 world leaders, made some impressive advances. It is imperative these talks translate to action, not just from the US but all nations.

Most significantly, President Biden committed the US to cutting its Greenhouse Gas Emissions in half by 2030, compared with 2005 levels. Canada, Japan and the UK also raised their targets, with the UK promising a 78% cut from 1990 levels by 2035; Japan aiming for a 46% cut by 2030; and Canada proposing a 40-45% cut from 2005 levels by 2030. The European Union also pledged to cut emissions by 55% from 1990 levels by 2030. All of these pledged to reach “net Zero” emissions by 2050. These were significant moves, if implemented.

As an Australian, I was disappointed and embarrassed by the then Australian Prime Minister’s lack of demonstrated commitment to either raising targets, or to reducing coal production. However, with some of Australia’s largest coal customers in Asia, such as China, Japan and South Korea, moving away from coal, Australia will have nowhere to go if it



Photo by Pat Whelen from Pexels
www.pexels.com/photo/green-grass-field-with-trees-10022603/

A landscape photograph showing a grassy hillside in the foreground, leading to a cluster of large, gnarled trees, possibly eucalyptus, in the background. The sky is clear and blue. The text is overlaid on the upper portion of the image.

We need to take a
much longer-term view
of our environmental
and ecological
systems, which are
tipping towards
ecosystem collapse

does not soon reduce its coal production in line with other nations. Furthermore, China, the world's largest carbon emitter; India, the world's third largest carbon emitter; and Russia, the world's fourth largest carbon emitter, all made vague promises but offered no new pledges or specific targets.

On the positive side though, numerous restorative and regenerative initiatives have emerged in the lead-up to the Summit. Here are a few significant examples.

Regeneration on the land

Global warming, especially the warming of the land, threatens the urban, mostly coastal, lifestyles that many of us enjoy. Out of control wildfires plague all continents.

In terms of food production, global warming has several detrimental impacts: temperature increases leading to heat stress, water scarcity, changing weather patterns, and rising sea levels that lead to contamination of irrigation water. Good fertile agricultural land is also being lost as a result of rapid urbanization. So our food and water security are already at risk, even without global warming and sea level rise.

The regenerative agriculture movement in Australia, and elsewhere, is a very important step in securing future food supplies in climate-vulnerable countries. The UAE as an arid country, which has for some time imported 90% of its food, has been a significant contributor in pro-actively improving its food security, through hydroponics and vertical farming. It has also committed to innovative food production including introducing new agricultural technologies. A recent example is of an Abu Dhabi AgTech start-up securing a \$100 million investment from a Kuwaiti business to expand its sustainable greenhouses across UAE and Saudi Arabia. It is not surprising that US Special Envoy for Climate, John Kerry, called on the UAE to partner with the US, the UK, Australia and other countries, in a project that would champion agricultural innovation as part of Climate Action.

The Agricultural Innovation Mission for Climate was launched at the Climate Summit. AIM for Climate will involve significant investment in agricultural innovation and Research and Development, to address reducing emissions in the agriculture sector (currently at 24% of all greenhouse emissions), increase food and water security, and create new economic opportunities, including employment.

The UAE has already created a dedicated open source "Food Research Platform" to promote best-practice scientific research on food and food-producing systems. Importantly, AIM for Climate will not just benefit well-resourced nations, but will share its research and technology to help farmers in developing nations cope with the effects of climate change.

Other initiatives announced at the Climate Summit by the US Energy Secretary include the \$1 Billion LEAF Coalition (Lowering Emissions by Accelerating Forest Finance) building on work by the EDF and involving the UK, the US and Norway, along with nine leading companies. Secondly, the US will partner with Canada, Norway, Qatar and Saudi Arabia to create the NET Zero Producers Forum. And thirdly, the US will partner with Denmark to "zero out emissions in the global shipping industry". The International Windship Association (IWSA) is doing vital work in this direction and would be a significant partner in zeroing emissions within global shipping. This point leads us to what is being done to regenerate the Ocean.

Regeneration in the ocean

The Ocean has already absorbed about 90% of the excess heat from global warming since the middle of last century and is reaching saturation point. Increasing Ocean temperatures affect all marine species and ecosystems. The high levels of CO₂ being emitted is absorbed into the Ocean, causing acidification which leads in turn to coral bleaching and loss of breeding grounds for marine fish and mammals. Ocean heating causes thermal expansion, greater storm surges and hurricanes, and ultimately significant sea level rise, inundating coastlines as we are already seeing, and threatening the Ocean food supply for humans.

The US Energy Secretary announced at the Summit they would be focusing on developing new technologies for carbon capture, energy storage and industrial fuels. Ironically, some of the best carbon capture technologies are provided by Nature for free. In addition to rainforests, Ocean or marine forests and meadows, are highly significant.

One of the best examples of carbon capture on earth is found in the Ocean in what is called "Blue Carbon". In a 2021 UNESCO report assessing its 50 marine World Heritage Sites it is noted that everyone knows that forests capture and store carbon. What is less well known is that the forests of the Ocean, and rivers—seagrass meadows, mangrove forests,

and tidal salt marshes—capture and store carbon “30 times faster than forest”.

Unlike land forests, according to Oscar Serrano, an Australian Blue Carbon expert, and a lead author of the UNESCO Report, these forests of the Ocean “work to furnish beaches and elevate the shoreline and seafloor, and thus not only store carbon but physically counteract sea-level rise”. Australia actually holds around 40% of these UNESCO World Heritage Blue Carbon reserves, with Australian blue carbon ecosystems sequestering 20 million tonnes of carbon dioxide a year (the equivalent of the emissions from 4 million cars). The Blue Carbon Lab, Deakin University Australia, is partnering with the James Michel Foundation in the Seychelles, helping the Seychelles to remain a “net carbon sink”. Other Small Island Developing States (SIDS) could follow their lead.

Another great hero of carbon capture is giant seaweed, or kelp. It is extremely efficient in soaking up carbon, it grows extremely fast—up to a metre a day—can be used in a wide range of products, from food, to bio-fuels, to industrial products and cosmetics, and unlike forest on land, it is not subject to wildfires. An advocate of the benefits of farming giant kelp and other types of seaweed, is Bren Smith, author of Eat like a Fish and founder of the GreenWave movement of regenerative Ocean farmers. Seaweed has long been part of human food supply, but went out of fashion in recent decades, when fast food became so readily available. Other activist groups involved in carbon capture methodologies, such as Climate Cleanup based in the Netherlands, and Project Drawdown based in the US, have researched and promoted the value of giant kelp and other sea vegetables in both carbon capture for Climate and also to supplement food supply as climate crisis continues to bite home on traditional agriculture and seafood.

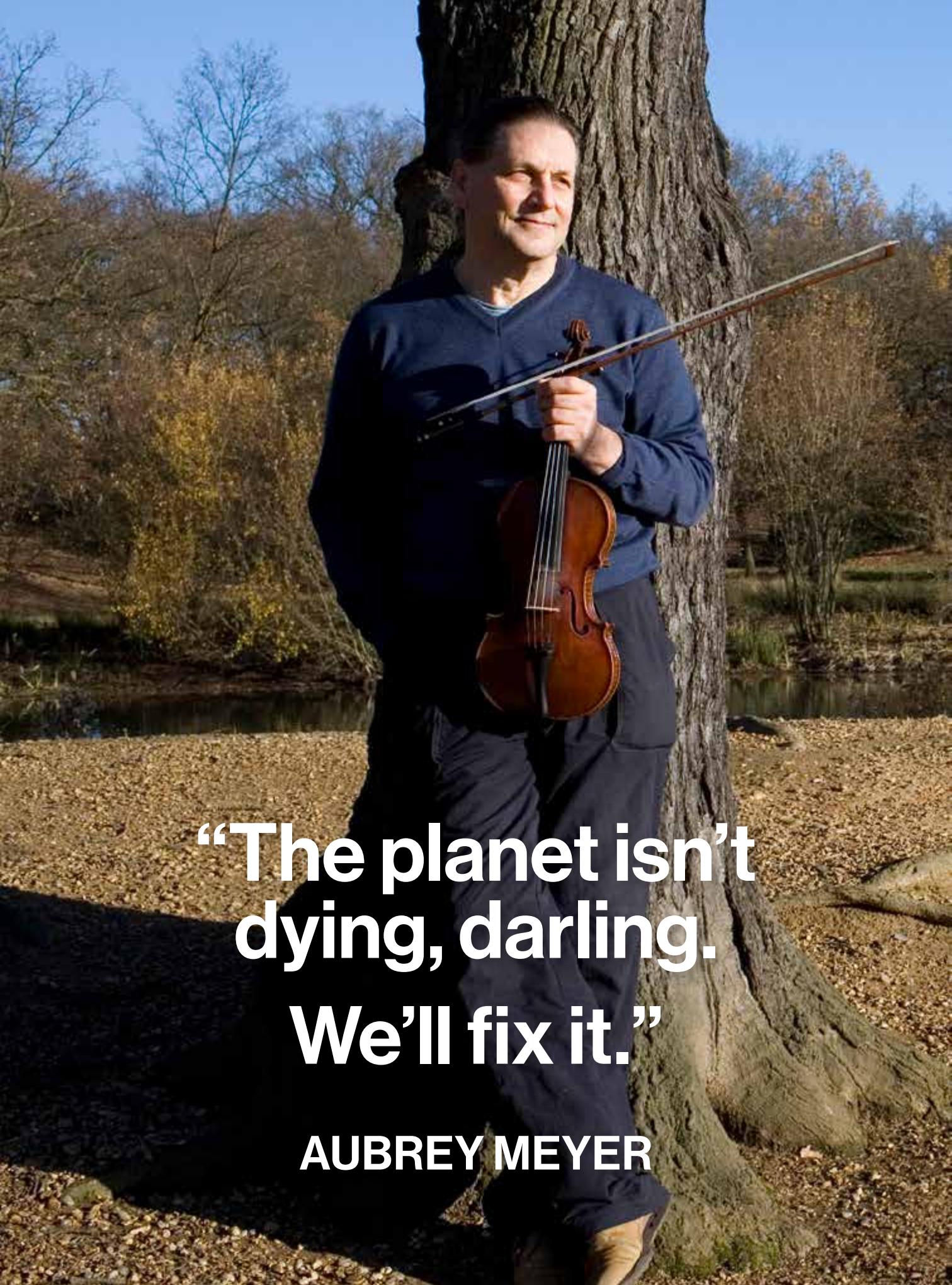
Concluding reflections

In this paper I hope to have made it clear that mitigation and adaptation alone are nowhere near enough to prevent the catastrophic projected impacts. These projected impacts include melting of polar icecaps and thermal expansion causing sea level rise; increasing super-storms and wildfires; food shortages from loss of arable land to drought, floods and contamination; and the demise of the Ocean through heating, acidification, coral bleaching and the loss of breeding grounds for marine fish and mammals.

While drastic mitigation measures must be taken urgently to reduce GHGs to net zero emissions by 2050, passive adaptation alone will leave tens of millions displaced each year, particularly in poorer regions.

As the outcome of the Climate Summit has indicated, nations and corporations must work together relentlessly to reduce emissions to net zero. But we must also build adaptive capacity. Most importantly we need to fast track carbon capture solutions, such as regenerative agriculture, and restorative and regenerative Ocean farming.

If humanity as a whole can pull together in these ways, without further delay, to co-evolve our future we will slowly, but surely, begin to regenerate land and Ocean.



**“The planet isn’t
dying, darling.
We’ll fix it.”**

AUBREY MEYER

CLIMATE

Get Ready for a ‘1.5 World’!

PROF PAUL READ, DR SARAH HOWE, DR TONY WEBB, TYLER KRAIN, SAIMA RAHIMI, SUZI KARADIMAS, LUCY CHAPMAN, DARCY MULLINS, GABRIEL FITZGERALD

This article is dedicated to the champion of global climate equality, the indefatigable maestro Aubrey Meyer, now 78, who developed the concept of Contraction and Convergence (C&C) in which every man, woman and child on Earth is given an equal budget of carbon emissions and national development converges on a sustainable budget. His lifelong work reached Number 10 Downing Street, all the way to inspiring Ross Garnaut’s efforts in Australia. Starting out as a brilliant concert violinist in South Africa, his four-year old daughter once asked him *“Daddy, is the planet really dying?”*. Putting aside his violin, he said *“Not if I can help it, darling”* and set about to fight for climate justice by establishing the Global Commons Institute. [His work can be explored here.](#)

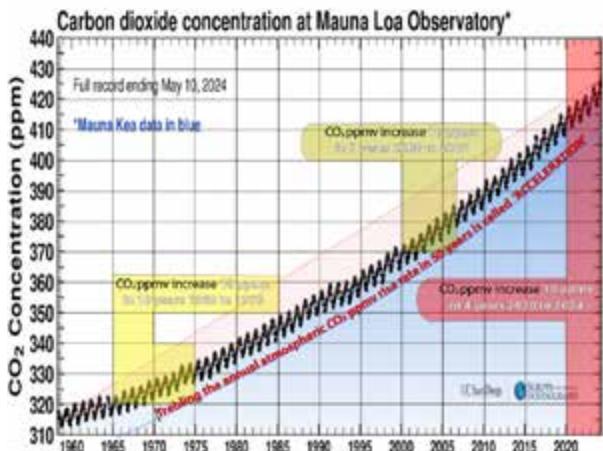
Aubrey is the recipient of the Andrew Lees Memorial Prize, 1998; Schumacher Award, 2000; Findhorn Fellowship, 2004; Eurosolar Award 2006; City of London, Life-time Achievement Award, 2005; Honorary Fellow of Royal Institute of British Architects, 2007; UNEP FI Global Roundtable

Financial Leadership Award, 2007. In 2008 a cross party group of British MPs nominated Meyer for the 2008 Nobel Peace Prize. He was nominated with wide support, for the Zayed Prize in 2010. He was nominated for the Blue Planet Prize, again with wide support, in 2014.

When asked whether he would like to coauthor this article, he gently replied as follows:

Dear Paul and Sarah,

Thank you for your kind invitation to co-author this article. My apologies for taking so long to respond. Seems to me that you and Sarah and colleagues have come to a developed and fair view of C&C (as per Ross Garnaut, etc.). Fair enough. Follow your instincts and go with that. For me, however, C&C was always about prevention—doing enough soon enough to try and avoid runaway rates of climate change. The views you have expressed reinforce this, as summarised in this chart:



Simply put, it is now too late for C&C. Prevention is no longer possible. Sadly, from now on, adaptation will always be to increasingly adverse conditions. It will not be fair. The momentum behind this adversity is now too great to avoid.

Thank you again for the offer.

All the best

Aubrey Meyer

A brief summary

The response from Aubrey Meyer, a champion of mitigation, is crushingly poignant, echoing the recent pronouncements by David Susuki and similarly impassioned pleas from David Attenborough. But we must fight on as all three still maintain there is a thin sliver of hope for a dying planet and a beleaguered humanity, a hope we will try to outline in the last half of this article. What follows is a long paper, covering a lot of ground, attempting to weave some ideas into a program that is likely to be only part of a solution or remedy to an existential problem. The world faces a crisis unprecedented at least in the period since humanity evolved. The continuing release of carbon dioxide and other pollutants into the atmosphere is creating a 'greenhouse effect' that traps more of the heat absorbed by the earth—a gradual but inexorable rise in global temperatures that is disrupting long established and relatively stable patterns of heat exchange in oceans and the atmosphere. These disruptions are already causing drastic changes in climate and weather patterns, notably leading to more extreme weather events resulting in increased frequency and intensity of droughts, fires and floods. To which is added the risk that some of these patterns, particularly those affected by glacial melting affecting

sea level rises and ocean currents may be reaching tipping points that further feed into the warming system, with more rapid disruption to patterns of agriculture and societies that may be irreversible.

Attempts to achieve international agreement to slow down, remediate and hopefully prevent these effects since the threat was clearly identified in the 1970s—a half century ago—have garnered at best very limited political support. World Conferences of Participants (COPs) have reached agreement on the need to set goals for reductions by target dates, particularly that global temperature increases above pre-industrial levels should be kept below 2 degrees Centigrade—and preferably below 1.5 degrees. Unfortunately, it appears that these goals are unlikely to be met. Two important papers published in January 2025 (Bevacqua et al., 2025; Cannon, 2025) suggest the 2016 Paris Agreement that set these goals is failing. Far beyond confirmation that we've already hit 1.5 is the ominous prediction that we're headed for 3.4 before the year 2100, with some models suggesting before 2050.

Below we explore:

- details from these studies and others that are indicating the scale of the crisis and our failure to meet it
 - reframing of the challenge in terms of some thinking around Raworth's 'doughnut model' that identified outer and inner limits for a functioning social-ecological economy, and how these might be applied practically in an international context through attention to:
 - » examination of human needs within the human rights framework,
 - » how global energy chains can support human flourishing in a climate constrained future,
 - » energy sovereignty across and within countries,
 - » feasibility of net zero by 2050,
 - alternative economic growth metrics based on measures of social flourishing such as longevity and wellbeing, social and economic equality starting with race, culture and gender—and how rather than seeing such changes as 'degrowth' or 'recession' such alternatives would shift from exponential growth in material consumption to experiential consumption and building infrastructure that adapts to a changing climate.
 - how these ideas might be applied in Australia in areas such as: welfare, taxation; housing, transport, distributed energy, and lessons we can draw from initiatives elsewhere in the world.

A big task and an attempt that will undoubtedly leave many gaps, questions and areas for further

discussion, but such is the role of the Fabians as we seek solutions that put working people at the forefront of solutions to the problems created by corporate dominated capitalism.

Recent studies showing we are breaching the international climate agreement

The first study led by Canada's Alex Cannon (2025) notes data from Copernicus Climate Change Service and the Berkeley Earth temperature update says that June 2024 was the twelfth month in a row with global mean surface temperatures at least 1.5 °C above pre-industrial conditions. They question whether this means the threshold minimum of the Paris Accord has been officially triggered. They note that two triggers exist—one is 12 months of consistent warming and the other is a future metric in which a 20-year mean crosses 1.5. The question is whether the 12 months is sufficient to presume the 20-year mean will follow suit. Using data from multiple models they find that 12 consecutive months of 1.5 degrees would suggest a 60-80% probability that even the 20-year average has been triggered early, long before 2030 and possibly -33 months to June 2024, bringing us backwards to around 2020.

The second paper led by Emanuele Bevacqua and colleagues (2025) also deals with the second trigger. From the Helmholtz Centre in Germany, it notes first that multiple datasets and approaches from different organisations converged on a 2024 average increase of 1.55 degrees above the pre-industrial baseline. The problem, as both papers point out, is that under the terms of the Paris Agreement acceptance of this cannot be based on a single year but must be assessed in hindsight only after decades of observation, which would be far too late. Using the Coupled Model Intercomparison Project Phase 6 (CMIP6), they test (combining actual data and simulations) whether a single year can be appropriately used as a red flag marker for a 20-year prediction based on 1981-2014. They found that a continuation of the strong warming trends observed over the last decades would render it virtually certain that the first single year at 1.5 °C signals a 20-year period of breakthrough warming.

These suggest the world needs to prepare for the imminent implications of a '1.5 world' as outlined in the IPCC Synthesis Report of 2023 (IPCC, 2023) – *viz.*, in summary, 3.6 billion people vulnerable to natural disasters, acute food and water shortages, mortality from floods, droughts and storms rising 15 times higher, irreversible ecosystem collapse, glacial

retreat, rising sea levels, widespread and accelerating species extinction, and the emergence of new and spreading vector-borne diseases. In essence, both these studies confirm that Earth has probably entered a 20-year period of global warming exceeding, and breaking, the agreed limits of the Paris Accord. The German paper further warns us that additional warming, towards 2 degrees, might still be avoided if rapid and stringent mitigation strategies are enacted today. Not tomorrow. Today.

While the German paper is strong, the Canadian paper warns that their approach can be altered by initial conditions and unexpected forcings that are not included in the models. Candidates for unincluded forcings include the Tonga eruption in 2022, changes to global shipping regulations, the strong El Nino of 2023-24, and the impact of COVID, the logic being that any difference between real-world and modelled predictions would indicate missing or unincluded forcings. Note this means we could be in for much worse than 1.5 before 2030. They finish on a call to examine these closely but warn this: *if 1.5 °C anomalies continue beyond 18 months, that is, taking us to February 2025 the breaching of the Paris Agreement threshold on both criteria is virtually certain.*

Together these papers suggest we've officially breached the Paris Agreement and we must immediately adapt to a '1.5 world', simultaneously ramping up efforts to mitigate against much worse. We've been making these warnings for decades; see the effort led by Prof David Karoly (who also writes in this edition). The timeline ominously matches our own efforts to test whether we can use C&C to constrain emissions within the SR1.5 budget established by Prof Malte Meinhausen before 2050, whilst still maximising human life expectancies across countries and time, against global human populations (see the final article in this edition). This crossed a threshold in 2023. Some time soon, we're going to have to make serious alterations to our socioeconomic, energy and infrastructure systems that transcend 'politics as usual'. We can do it with resource wars and misery or else creativity and compassion. We like to think most people would choose the latter no matter what flavour of politics they prefer.

Just over the past few months a host of other papers have confirmed the worst.

- The Bureau of Meteorology confirmed Australia smashed temperature records again and ANU Professor Sarah Perkins-Kirkpatrick says "same shit, different year".

- Nature articles identify 34% of arctic zone at climate tipping point - After millennia acting as a store for CO₂, a third of the arctic boreal zone is now releasing it as permafrost melts from warming roughly three times faster than the rest of the world (more than 3 degrees since 1970 alone).
- Ocean shows record heat gains since 2010—Team of 54 scientists across nations shows ocean, which traps 90% of global warming, steadily heated over the past 5 years trapping another 16 zettajoules in the top 2000 metres—equivalent to 140 times the world's total electricity output.
- Save the Children publishes climate resilience report showing Gen Alpha will suffer 7 times more heatwaves, close to three times river floods, crop failures, and droughts, twice the wildfires, than we do now.
- James Hansen, world's leading climatologist, publishes paper announcing we have officially failed the Paris Agreement—we will reach + 2 degrees by 2045
- A meta-analysis of 3286 observations from 157 studies confirmed by separate AI model shows microplastics are interfering with photosynthesis, affecting land production by 12% and oceans by 7%, due to add another 400 m suffering starvation within two decades compared to current 700 m people.
- Disordered behaviour in species across 38 countries.
- Microplastics in human brain up 50% in 8 years, reaching the collective size of a plastic spoon (7 grams).
- Spermageddon' by 2045? A significant meta-analysis in 2017 revealed a 52.4% decrease in sperm concentration and a 59.3% decrease in total sperm count in men from North America, Europe, Australia, and New Zealand between 1973 and 2011. Again, related to plastics and estrogenic leakage.
- Insurance giants say capitalism collapses at 3 degrees. The economic value of entire regions—coastal, arid, wildfire-prone—will begin to vanish from financial ledgers. Markets will reprice, rapidly and brutally.

What these show is that it's already happening and these are just a tiny selection of recent studies relating species extinction, pollution and climate change as evidence of capitalism committing suicide.

Ok we have a problem—what's the solution?

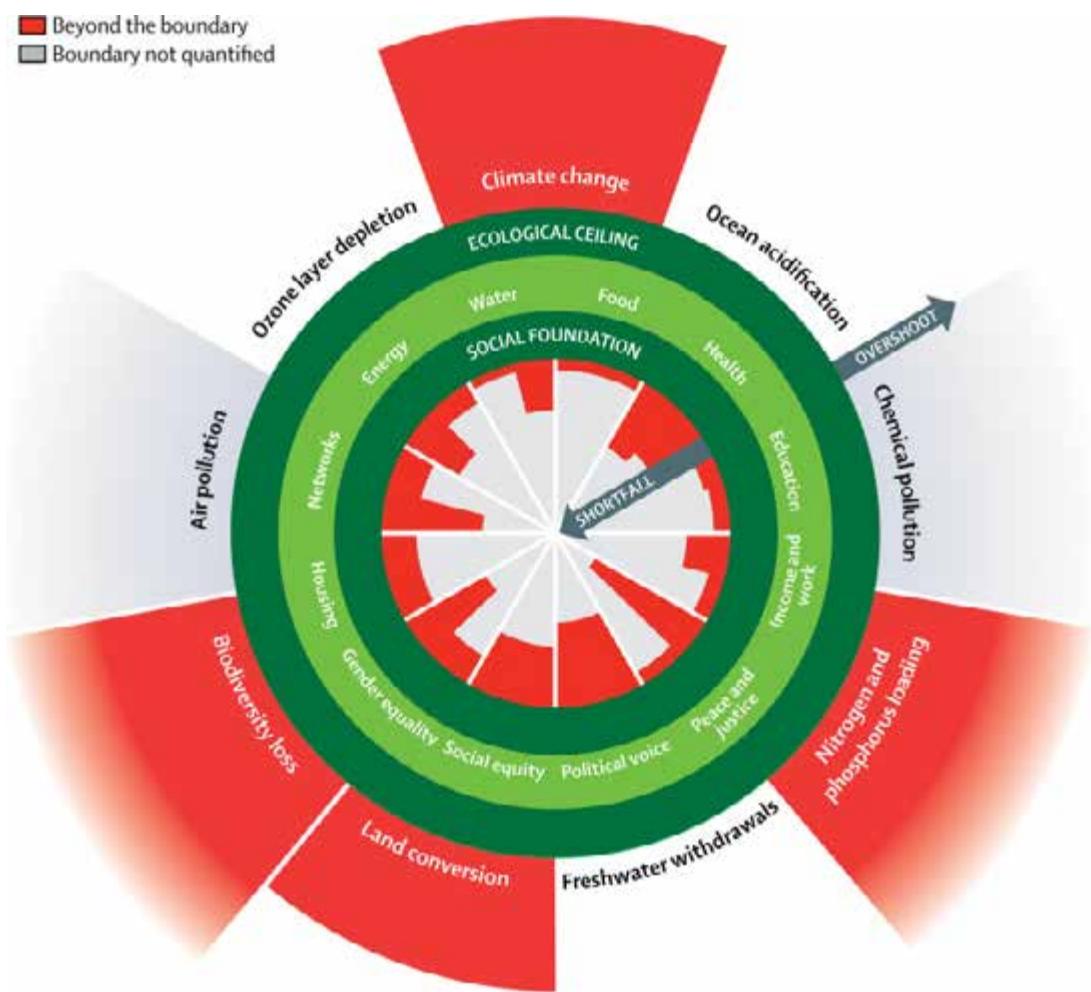
It would be easy to say that the political work has barely started yet and we've already breached at least four and possibly now seven of nine planetary boundaries in the midst of multiple crises—carbon, extinction and inequality among them. What are those planetary boundaries and how do they relate to politics?

Let's back up a bit with a short description of original research being undertaken by Fabians' Sarah Howe and Paul Read based on economist Kate Raworth's Oxfam- and Oxford-affiliated Doughnut Economics (Raworth, 2017), a system challenging neoliberal economics and championing work by Fabians-affiliated London School of Economics.

Consider Kate's doughnut, showing how at least four planetary boundaries have been breached—land, nitrogen and phosphorus loading, species extinction and climate change—even though they represent the boundaries of the inner circle in which human needs are meant to be satisfied by the variously insane socio-political systems that our collective creativity has so far (failed to have) manifested since the Enlightenment. This is an older depiction of the doughnut as more recently we surpassed seven boundaries.

Within the inner circle are 12 social foundations that reflect about 250 years of thinking and research that culminate in something akin to the 17 Sustainable Development Goals—stuff beyond GDP per capita and UN Human Development Index, and such. Of course, post-modernist thought would now demolish the lot because of its obdurate resistance to anything close to representing universal values that might unite humanity. Instead, it seems to prefer the anarchic chaos of cultural relativity in the face of a truly existential threat to human existence necessitating some form of universal agreement that can only emerge from the quantitative efforts of a toxic patriarchy. But that's another story, thank you very much Firestone and Foucault.

Raworth's 12 social foundations are universal across 194 UN member states and 8 billion people—men, women and children. While people might be united in their need for food, water, housing/shelter, health, education, secure and meaningful work, peace and justice, political voice, social and gender equity, and socioeconomic networks, some of these social foundations might be more important for some people than others, or indeed at different levels of national development. But what unites us is the need to challenge head on



Kate Raworth's Doughnut in which 12 social foundations serving human economies must be constrained within 9 planetary boundaries

those who would deny or argue we keep stum on all the evidence, dismiss it as a UN conspiracy, and miss the opportunity to save the whole damned planet, including the denizens of Nature on the verge of the sixth mass extinction as well as the idea that men, women and children all deserve health, equity, safety and an intact social contract. Let's challenge those arguing and 'virtue-signalling' on social media who pose as victims and misappropriate the narratives of social and economic hurt to demonise those of us struggling to expose extreme views (from both sides of politics) that whitewash, greenwash, genderwash, and racewash a system rotten to its core.

Some practical steps towards an ecologically, socially and economically sustainable future

As democratic socialists we recognise that tackling socio-economic inequality is essential to any hope of

tackling climate issues. You'd be right to think we're a tad fed up with rhetoric on all sides of politics that ultimately hides what amounts to socioeconomic gaslighting—one that feeds the monster of modern inequality and simply shifts power structures from one capitalist group to another. Those entertaining anything akin to true freedom and meritocracy (not the usual capitalist sleight of hand) are engaged in another layer of self-deception and it's time they owned up—or were called out. By the same token, this is getting mightily serious at a global level and there's no longer any room for inauthentic socialism working from a position of magnanimous power—whether across sexes, races or generations. We can't keep using our socialism to patronise the weak and valorise our virtue. We must act and probably act with courage and self-sacrifice.

In the meantime, while we await the revolution, what measures can we take that move us in this direction? It has been said that Aubrey Meyer's C&C

concept (Garnaut, 2011) is perhaps the only feasible equity lever for global carbon emissions towards net zero. The concept in its simplest form is to contract global emissions whilst giving nations an equal per capita target—it focuses on the unfashionable mitigation work (changing our consumption habits) rather than the sexy adaptation work (technology as saviour).

Early work on mitigation using C&C showed a form of Pareto Efficiency (see <https://www.youtube.com/watch?app=desktop&v=Lvx2MMiLBI>) at moderated targets of 6.6 tonnes per capita, based on human outcomes akin to Richard Layard's WELLBY and Veenhoven's Happy Life Year, a composite of life expectancy and human wellbeing that can also be used to compare countries across time based on political and economic systems (Read et alia, 2013; Read, 2017). It also resonates beautifully with Jim Chalmer's recent commitments to developing a Wellbeing Budget, an approach which appropriately uses a dashboard of metrics even if the metrics are not wholly, as yet, in keeping with recent developments in public health and economics. What's more it has the capacity, using cumulative historical emissions, to inform repatriation levers between developed and developing countries differentially affected by climate change, aka the Brasillian Suggestion. The same approach, using frontier regression adapted by Nobel laureate Amartya Sen for the Millennium Development Goals is now being used for the 2030 UN SDGs (Read, 2017).

In Australia, Dr Read's students are using the method to identify social flourishing targets within planetary boundaries based on Kate Raworth's 12 social dimensions in Doughnut Economics. However, the problem is that Kate Raworth's doughnut, although it resonates with the work of LSE's Ian Gough (inspired by Maslow) on human needs, has, as yet, no way of empirically measuring the exact target for the 12 minima. Frontier regression attempts to resolve this with reference to Maslow's Hierarchy and Max-Neef's economic needs theory. This has cascading implications for net zero negotiations driven by the Paris Agreement, as well as the current arguments around national accountability presently being held at the International Court of Justice in The Hague. As the world uses more of its \$150 carbon budget (Meinhausen's budget), this value diminishes each year, losing capacity to satisfy human needs. Dr Read's students are focusing on the social dimensions of food, health, education, income and work, peace and justice, social equity and gender equality.

Dr Howe, former Fabians Chair and recognised

expert in the global value chains of energy, is simultaneously building the broader argument around the feasibility of achieving net zero in a way that satisfies the political economy of human needs within the doughnut framework. Her work will be supplemented and informed by the results from Dr Read's lab and will focus on elaborating the implications of the work for:

- an examination of human needs within the human rights framework,
- the degree to which global energy chains can support human flourishing in a climate constrained future,
- the geopolitical need for energy sovereignty across and within countries,
- the feasibility of net zero by 2050, and
- the implications informing ongoing negotiations at the International Court of Justice in The Hague.

The end result will be a set of target minima for human needs, against which countries can all be assessed as falling within, nudging up, or blasting through the nine planetary boundaries that constrain economic growth and social systems. Nobody likes constraints, much less neoliberal growth fetishists, but the rising tide of sustainable solutions being offered in its place now paint a far prettier picture for human progress, if only we can break free of old thinking and some elements of human nature.

The way forward

This article began with a litany of red flags and warnings. It'll finish with what sustainability could look like if economic growth metrics were replaced with measures of social flourishing such as longevity and wellbeing. It will also point to some of the work being done that attempt to put these into practice. The reason we do this is because the vast majority of concerned and educated voters are crying out for a vision of a sustainable future—not just more climate threats but actual opportunities.

What should a 1.5 world look like if we act now?

The age-old problem of Pareto efficiency, in which redistribution of resources leaves nobody worse off, can never be solved using dollars as the metric, but becomes eminently solvable when shifting to something more akin to human health and happiness. Moderation rather than linear growth becomes

key, in which case the extremes of an inverted U curve, all converging on a moderated target that allows redistribution to maximise outcomes for everybody—a long and happy, meaningful life. This is a simple feature (and indeed outcome) of a healthy metabolic system constrained by feedback loops. Moreover, it operates for all human needs, through social and esteem needs, up to self-actualisation. Not enough oxygen and too much oxygen kills. Not enough water and too much water kills. Not enough food and too much food kills. The poison and the remedy both defined only by the dose. The same applies to inequality, economic growth, justice, power and a host of socioeconomic metrics, of which there are 10,000 collated by the UN and WHO. The majority optimise at a moderated target as opposed to real poisons like war, homicide, and disease.

Gender equality is one metric that optimises social flourishing but happens to fall among the basic human needs—as important as food and water—compared to economic growth, which is far less important for human outcomes than previously thought (as is the carbon emissions supporting it). As the Chinese Maoist saying went “Women hold up half the sky”. They are as critical to any economy as they are reproduction and child care. Their education and economic liberation is also critical to managing the growth in global population. The fascinating thing about the frontier results is that human flourishing does not swerve towards either men or women but holds at perfect equity—a 1:1 ratio where both men and women are equally treated.

As indicated above, economic equality—or at least a reduction in inequalities that see a handful of rich men owning more than a quarter of the world’s wealth—is also critical to solving the climate crisis. Previous studies suggest we need to moderate our annual targets for economic growth to around 3%. Actual equality measured using the Palma ratio (a simple calculation of the amount owned by the top 10% against the lowest 40%), far from requiring perfect outcomes, suggests the richest 10% should not own more than five times the amount owned by the lowest 40% on average. Such a measure is neither pure communist nor pure capitalist. It still preserves incentivisation for productivity. Food stuffs and caloric intake using this method all point towards known dietary requirements and even replicate the Harvard Food Plate (which replaced the Food Pyramid) As was suggested by a medical doctor at a UN sustainability forum hosted by the Malaysian PM in 2013, true Pareto efficiency could be achieved if we could somehow shift the fat around his waist to the

bones of children in drought-stricken Africa.

Pareto efficiency can be achieved if money is subordinated to human needs as it should be, rather than serving as an evolutionary signal for sexual fitness (driving human social hierarchies). In fact, we could go further and suggest that the deeper drive for signalling sexual fitness via resource hoarding is ironically driving the very thing it’s meant to avoid—reducing the reproductive viability of our own young—an issue being explored under the title of “Sex & Sustainability—the Jane Austen Paradox” by Dr Read’s group with evolutionary psychologist Dr Danielle Sulikowski at Charles Sturt University.

Aside from the mismatch between human needs and the economic system we’ve developed, the broader work of seeking to replace GDP with more human-centred metrics began taking form when Amartya Sen and colleagues spearheaded the Human Development Index, later took form in the context of climate change with Nic Marks’ Happy Planet Index (Marks et al., 2006) (and China’s Green GDP, a failed experiment), and was further valorised by two efforts that came out about 10 years ago—Wilkinson’s *Spirit Level* (Wilkinson & Pickett, 2009) and the Sarkozy Commission’s work on human wellbeing as an alternative measure of economic output, work again supported by Nobel prize winning economists (Fitoussi, Sen and Stiglitz, 2010). The Earth Institute took up the call in its development of the World Happiness Report and Richard Layard’s construction of the WELLBY (Helliwell et al., 2024), a metric similar to Veenhoven’s Happy Life Year (Veenhoven, 1996). These fit nicely with Raworth’s (Raworth, 2017) doughnut economics and the broader work of the SDGs.

What could a world look like under social flourishing metrics instead of the blunt and rusty razor of GDP per capita?

The 20-Minute City could evolve and unfold around a central point where residents can access most of their daily needs within a 20-minute walk, cycle, or public transport trip with a radius of one kilometer. Housing could still provide a mix reflecting age-appropriate needs and personal expression. Household commercial and industrial energy, in the form of electrical power or sustainable electrically-generated hydrogen could come from a mix of solar and small-scale hydrogen plants with underground wires and piping, all of which have been trialed along with energy efficient housing using roof and wall paints to

suit the climate. Connecting roads for freight would remain but communities could retrofit roads into interconnected green spaces (for other species to flourish) and waterways with smaller paved tracks for smaller electric vehicles and cycling. Public transport would require smaller shared vehicles capable of moving children and groceries. Work-from-home could be encouraged, as could schooling from home, allowing socialisation to focus on play, community events, building and localised permaculture. Schools and childcare would mix at-home care with community engagement.

Buildings could be retrofitted for energy efficiency, which includes vertical growth of harvestable plant-life (even in major cities), further providing shade and cooling against the urban heat island effect (multiple studies have shown tree coverage and foliage are key to adapting to climate change). Local markets would shift from imported to local produce. This could extend to the production of cultural products, e.g. shifting from scaled and globalised music by celebrities, for example, back to supporting home-grown artists from local communities through live events. Employment could be supplemented by UBI (multiple studies now show this encourages localized economic growth by allowing people to pursue their own creative endeavours, trades and small businesses). Local theatres, libraries, museums and art galleries could be cooperatively run to serve local talent, schools and cultural and community events.

A major part of the circular economy includes recycling of human waste. This offers multiple avenues for localised processing for both energy and agriculture. For energy, systems rely on anaerobic digestion where microorganisms break down waste into biosolids without oxygen. This produces methane to generate electricity, as well as digestate stabilized biosolids rich in nutrients. The latter is further treated for safety to use in agriculture using processes like dewatering, composting and thermal drying. The biosolids can also be incinerated or gasified to produce ash, bio-oil, bio-char, phosphorous, nitrogen and magnesium.

As well as producing green by-products there are also nutrient recovery technologies to extract nutrients from liquid wastewater streams that also go back into the system for agriculture production. Note all of these systems work more efficiently in localized, small-scale community ecologies. All of these represent a shift from simple disposal to sustainable resource management, turning a waste product into valuable resources while protecting public health and the environment.

Some practical measures towards sustainability in a 1.5 world and specifically Australia?

As noted above, the changes needed would not necessarily entail degrowth or recession, but rather growth would shift from exponential growth in material consumption to experiential consumption and the sharing of more localised trades, services and produce, thus breaking inefficient inequality drivers like globalised scalability of cultural collateral (music, art, entertainment, food). It would simultaneously mitigate carbon emissions, species extinction and pollution by developing policies that modulate human consumption patterns, whilst also building infrastructure that adapts to a changing climate. Far from fears of one-world government, participatory democracy and localised economies would be nurtured in small-scale cities—the village model underpinning the 20-minute city, supported by economic cooperatives.

Tax reform will be needed to achieve both socially available capital and to reduce inequality. A first step towards this in Australia would be to remove capital gains tax as a subsidy of housing speculation so sustainable infrastructure costs could be funded—the Grattan Institute puts this at only \$11.7 billion. Another would be to gently phase in forms of death duty to break transgenerational hoarding whilst reducing base-level income tax in favour of what amounts to a reset at birth to incentivise individual productivity. These are no longer wild ideas but favour true meritocracy rewarding risk, hard work and talent. They need not be so extreme as to entail wholesale revolution but rather gradualism in the great tradition of Fabian incrementalism. Nor are they meant to incite fears of a WEF or communist conspiracies in which people ‘own nothing but are happy’. Ownership remains but the rules of transmission are moderated for local, rather than global, economic outcomes—outcomes that serve individual and community health and cohesion rather than aggregated and scalable economic extraction serving a globalised elite. The local cooperative would become a hub of community economic development, owned by community but equally free to trade comparative advantage.

The second measure would be to institute output metrics measuring human health and longevity alongside supporting policies that encourage localised circular economies. This is especially important in the building industry for new homes as we need a new breed of incentivised master builder to creatively

reuse materials for ultradurable longevity (rather than current levels of extravagant waste and 60-year building lifespans) even if it costs them more in terms of labour. They become more specialised in integrating technologies, just as car mechanics have become adept at integrating computer technology and will continue to adapt as we shift to electric vehicles (with electricity generated from renewables).

The third would be to explore more progressive taxation to reward sustainable industries and take the edge of inequality, trialling a UBI for certain sectors and gradually phasing out income tax in favour of a more nuanced GST targeting unsustainable luxury goods (like SUVs) as well as outright poisons like alcohol and tobacco. Not in the way of a ban or blunt Pigouvian tax (which simultaneously encourages tobacco wars as well as deeper poverty among entrenched addicts), but rather localised production and, in some cases, community support services via, for example, NDIS.

This is not meant to be creating a government-regulated straight-jacket of wowserism but simply a more moderated system of living where time, family, community and artistic endeavours can be properly respected and nurtured at the local level. This replaces the growth and efficiency fetish of a 60-hour work week (at least among those with a job) and is more in tune with what UK economist and UBI expert Guy Standing describes, with reference to ancient Greek conceptions of productivity, as time for recreation, care and creativity being equally respected as 'work'. This takes the heat off the drive to addiction fostered by modern conceptions of work, in short allowing rest and recreation to nurture talent, business productivity, and even self-actualisation through creativity, courage, compassion and unpaid care (once described as the 'work of women' by Amartya Sen's Oxford PhD supervisor, Prof Joan Robinson).

Guy Standing further says we need to revive the commons. The shift from middle class to precariat needs to be halted through 'commoning' at the local level, which he describes as the most important form of meaningful work—the local care economy and volunteerism recast as productivity in place of work conceptions created by rentier capitalism driving neo-feudal slavery through the 100-year old obsession with inhuman productivity efficiencies. Of course, all this needs housing and community infrastructure to support it. Experiments in family-friendly, high-density housing have been underway in Canada since 1992 and Brazil since the 1970s.

Other experiments in green, energy-efficient urban

planning have been rolled out in a host of other nations.

- Copenhagen has established cycling highways.
- The Vauban district in Freiburg, Germany, has integrated passive energy housing using ultra-high levels of insulation, airtight construction, high-performance triple-glazed windows, with extensive roof-mounted solar panels, along with a local woodchip electricity generator. They manage water through permeable pavements, green and productive roofing that absorbs water, bioswales (vegetated channels that filter and slow runoff), and infiltration trenches to allow rainwater to soak back into the ground naturally, reducing flood risk and replenishing groundwater.
- Singapore has further integrated vertical greenery with high density living (green walls and rooftop gardens) plus a network of horizontal interlinked parkways with reclaimed water purified by membrane technologies.
- Since the 1970s, Curitiba in Brazil has used elevated tube stations for localized public transport; Cambio Verde goes a step further allowing low-income residents to exchange waste for public transport tokens.
- Oslo in Norway has fully instituted electric vehicle support infrastructure.
- Amsterdam is tackling rising sea levels by building floating neighbourhoods (there are many around the world) and building entire circular economies by rewarding the reuse of building materials, reducing food waste and promoting repair. Planned obsolescence is banned and monitored, as it should be. Construction waste in Australia is an issue because building materials have been relatively cheap compared to labour, causing a fast, throw-away business model by most tradies leaving mountains of waste behind.

Masdar City in UAE is something of a jewel in the crown of sustainable communities designed from the ground up to test renewable energy with large solar installations supported later by localised hydrogen plants, energy-efficient building design, water conservation, waste reduction, and sustainable transport (including early trials of autonomous electric pods). It serves as a living lab for green technologies in a hot climate, even using simple black and white paint to modulate energy. Green hydrogen production is planned for worldwide rollout by Masdar. This uses renewable electricity generated from sources like solar or wind power to drive an

electrolyzer. The device splits water (H_2O) molecules into their constituent elements: hydrogen (H_2) and oxygen (O_2). Because the electricity source is carbon-free, this electrolysis process produces hydrogen without emitting greenhouse gases. The resulting hydrogen gas is a versatile, clean energy carrier. It can be stored, transported, and used in fuel cells or turbines to generate power, heat, or fuel vehicles, releasing only water vapor when consumed. Oxygen is the sole byproduct of its creation. And hydrogen plants can be safely built in small local units.

Although Masdar is looking at hydrogen it already relies on solar energy. This includes a significant 10-megawatt utility-scale photovoltaic (PV) plant covering a large area, extensive rooftop PV installations on buildings throughout the city, and explorations into concentrated solar power (CSP) technologies. To combat the hot desert climate with minimal energy use, Masdar also incorporates specific design technologies. This includes narrow, shaded pedestrian streets oriented to funnel breezes, buildings clustered closely to shade each other, high-performance insulation, specialized low-emissivity window coatings, and facades designed for shading and deflecting solar radiation (in other words, white paint on walls and roofing).

A modern interpretation of a traditional 'wind tower' (barjeel) was also built to help cool public spaces. In an arid region similar to many areas in Australia, water technology is crucial. Masdar employs greywater recycling systems within buildings for non-potable uses (like irrigation or toilet flushing), and advanced wastewater treatment facilities to maximize water reuse across the city, significantly reducing reliance on potable water sources. A system of waterways act to cool the city whilst providing recreational and aesthetic uses. As to transport Masdar has constructed personal transport and electric vehicles city-wide using small, automated, electric pods running on dedicated tracks supported by electric buses and widespread EV charging infrastructure. Supporting this, Masdar also utilizes smart technology to monitor and manage energy consumption efficiently. This includes smart grids to optimize energy distribution from various renewable sources and sophisticated building management systems within structures to control lighting and cooling.

All up, Masdar is a model of sustainability that suits Australia's arid climate. Already tested and in operation, it offers an aesthetically enhanced solution to the 20-minute city. If all this is combined with some solid exploration of policies focused on human

social flourishing as the main output to economic growth then energy sovereignty as well as human health and longevity, not to mention equality, could contribute to a 1.5 world in which our children have hope, health, time to live and breathe.

It's long past time when false ideological dichotomies and their tribalistic battles should give way to evidence-based policy that is agile and adaptive in a fragile world.

To conclude

What we have attempted here is to highlight the real and urgent nature of the crisis posed by what has been called 'climate change'. It places this existential crisis in the context of its challenge to develop a more socially and economically as well as ecologically sustainable future where the old order can no longer serve the needs of humans (or other life) on this planet. What it also attempts is to highlight some of the changes that are essential if we are to either avoid or at least mitigate some of the worst consequences of climate change—to illustrate how they are far from being idealistic or in need of what some might call 'the revolution'—though their effects if we were to achieve many would indeed be revolutionary—but arrived at by evolving changes based on both social-democratic government policies and popular participation in practical steps towards agreed goals. In addition they use technologies already being rolled out around the world.

Like most writings—and the speeches of concerned politicians and activists alike—these are merely words—and remain just words until we translate them into political action. We are doing our bit, and we suspect most who read this will be also. How do we now engage and build a majority that insists action be taken now? At a time when we are breaching the 1.5 degree target, action is crucial to avoid the worst.

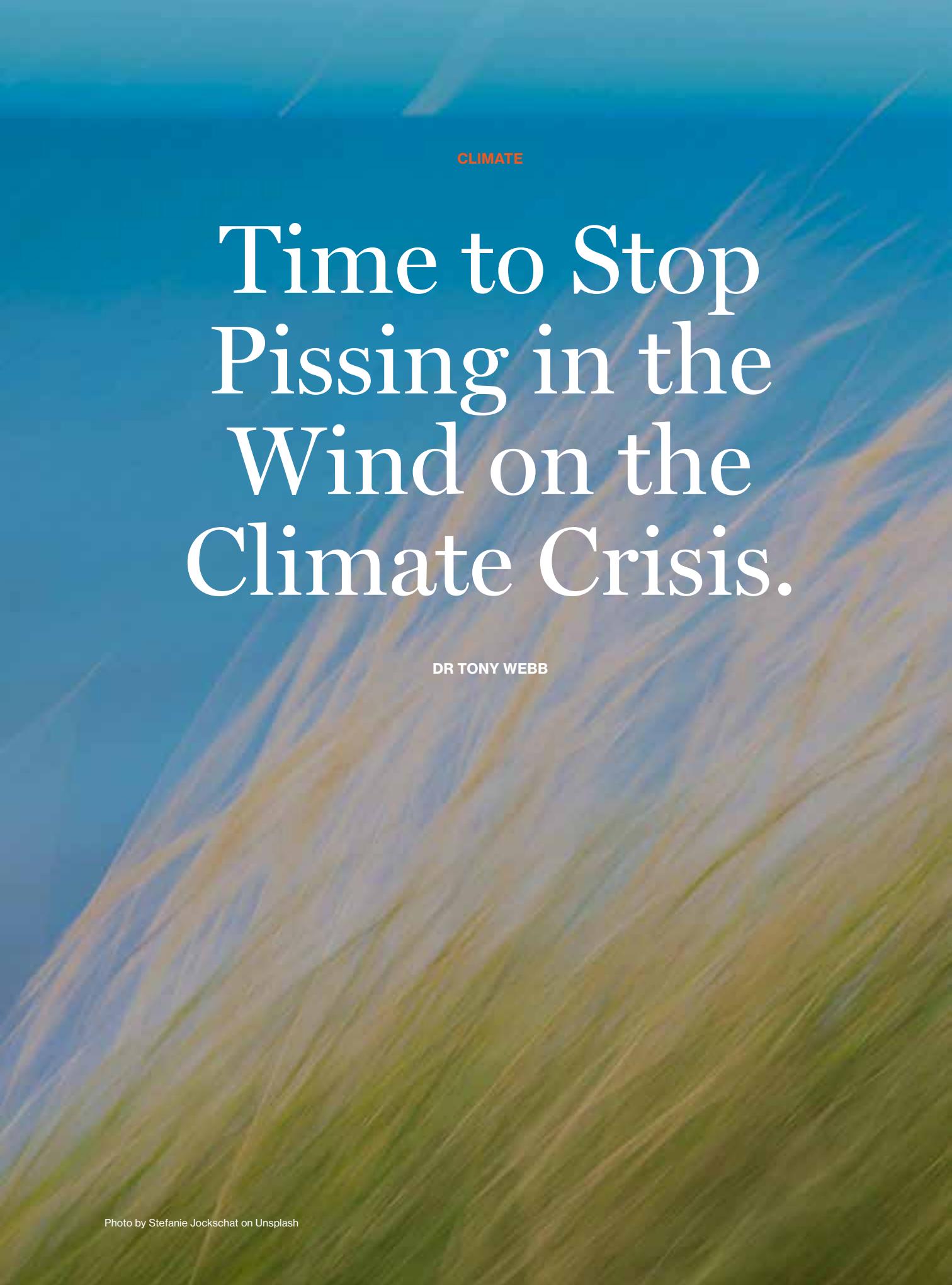
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Never Never Was

BY CARL GOPALKRISHNAN



CLIMATE

Time to Stop Pissing in the Wind on the Climate Crisis.

DR TONY WEBB

Forgive the crude analogy but I learned as a very young boy that whatever relief I might get from emptying my bladder would nevertheless end up very messy if I did it facing the prevailing wind. Reducing the burden of carbon polluting gasses driving rising global temperatures and severe weather events by burning less coal and gas for electricity generation in Australia while necessary is not sufficient. If we keep exploring for, extracting, and exporting ever increasing volumes of these fossil fuels to be burned elsewhere the global burden of carbon pollution will increase not decrease. Without stretching the metaphor very far we will be pissing in the wind of changes that threaten if not human existence at the very least much of the political, social, economic, ecological framework that defines our current way of life on this planet.

Australia is a global player in this crisis

Australia is one of the largest global producers of coal, gas and to a lesser extent oil. It is the world's third largest exporter with over two thirds of its production exported to be burned elsewhere. Together, domestic and exported fuel production is effectively contributing about 13% of the global CO₂ burden. Faced with an urgent need to stop all further expansion and strategically phase out these sources of pollution our government instead provides \$11+ billion annually as subsidies to companies contributing to this carbon pollution. Worse, since coming to office in 2022 it has approved significant expansion of coal and gas mining, and applications in the pipeline for exploration and extraction licences will permit a further 20 bn tons of CO₂—about 40% of future projected annual global emissions! On our own Australia will be completely blowing the remaining carbon pollution budget needed to keep global temperature rises from pre-industrial levels to below 1.5 degrees. At best, the world is currently on track for close to a rise of 3 degrees with a globally catastrophic 5-6 degrees likely unless there

is significant international commitment to phase-out reliance on coal, oil and gas as the primary energy sources for use in domestic, industrial-commercial, transport, and agricultural settings.

Developing and effective policy response

This challenge needs to be addressed by Labor governments here at federal and state levels. While playing catchup on ten years of inaction under the Coalition, indeed denial regarding the contribution of carbon pollution to the climate emergency, the current government's targets include:

- Australian electricity supply of 83% from renewables by 2050
- 43% reduction in Australian CO₂ emissions by 2030
- 'Net Zero' emissions by 2050

Yet even these are woefully short of the contribution needed to meet the challenge of limiting temperature increases to 1.5 degrees. Perhaps worse, they rely heavily on highly dubious 'offsetting' where claimed tree planting and non-land-clearance schemes are used to claim semi-permanent natural storage of carbon rather than actual pollution reduction.

A more realistic, rational and indeed essential approach would include (alongside policies for land use, agri-food industry development, water supply, and biodiversity conservation), clear and unambiguous commitments to closing down Australia's coal, oil and gas industries on short-term rather than long term timeframes. In practical terms this would include:

- Immediate removal of all forms of government subsidy to coal oil and gas industries and diverting these funds to support development of clean energy production, distribution and appropriate forms of community ownership.
- A clear statement of federal policy (using 'Foreign-Affairs powers' if necessary to override the States) that no further licences will be given

for exploration or extraction of coal oil or gas in Australia. This sends a clear signal to the world that Australia is closing the leaking tap that results in CO₂ emissions from burning these fuels and leakage of even more shorter-term polluting methane gas from extraction and distribution.

- Voluntary, or if needed statutory, ‘fuel-reservation’ arrangements that ensure fuels extracted under existing licences first meet Australian needs for the period of transition at affordable prices before being considered for export—and with royalty and taxation arrangements on these exports that reflect the value of these as non-renewable Australian resources that can be used to support domestic consumers and the transition to renewable energy technologies.
- A comprehensive review and where necessary revocation of export licences such that no Australian fossil fuels can be exported to countries with less stringent policies and programs for carbon pollution reduction than our own in Australia.

A focus on the alternatives

We can anticipate opposition to such policies—indeed regurgitation of some of the old T.I.N.A. (There Is No Alternative) in support of continuing or only slowly reforming current practices. Against this, we will need to develop TAMBA (There Are Many Better Alternatives) arguments. The main arguments against Australia reducing its fossil exports are that: it will cost jobs, increase prices, stop other countries from developing, hurt the poor and disadvantaged here and overseas, and ultimately be futile as other suppliers fill the vacuum ; ‘if we don’t supply these fuels someone else will’.

To these arguments, note first that the number of Australian jobs in fossil fuel mining is actually quite small. These jobs will be phased out inevitably over time as the world is forced to adapt to the climate emergency. What is needed is a strategically planned ‘just transition’ where training for and investment in new ‘good’ jobs is provided ahead of any closures. What is planned here is that there will be no more jobs created through permits for, and investment in, new fossil fuel projects—investments that will increase the scale of the crisis, take resources away from development of jobs in renewable alternatives, and ultimately result in both unsustainable jobs and stranded assets—financial and human.

As noted above the scale of emissions from exported fuels that are not counted as our responsibility dwarfs those that we see ourselves as ‘accountable’ for. Would policies for reducing these alongside our own domestic emissions have the damaging economic impacts claimed—and be ineffectual anyway as other suppliers fill the gaps in the global marketplace? Maybe, but given the scale of our current contribution to supply, other countries scaling up to take advantage of our decision will be temporary. The economics might be temporarily disadvantageous to Australia but would drive up international prices (from which remaining Australian exports would benefit). The increased costs would impact the disadvantaged here and in other countries—and require offsetting measures to tackle such inequalities in the short term. But on a global scale, and in the mid-to-longer term, the overall economic consequences would be significantly advantageous for all—protecting all from the more disastrous consequences of the impending climate catastrophe and driving take-up of what will be increasingly cheaper renewable alternatives.

New political economic thinking

Finally, rethinking the political economy (see earlier article on values based political economy in Issue 5) we may need to argue for a shift from the marginally Keynesian approaches that have found some cross-party support to a more radical approach. There is massive investment needed to make the transition from fossil-fuels to a globally competitive renewable energy-based economy. This might usefully embrace more of the Modern Monetary Theory (MMT) approach that suggests money for investment is not ‘borrowed’ from existing pools of ‘savings’ but created with few limits by central banks of countries that have their own currencies. In such a framework, the funds needed for investment to permit rapid transition to ‘clean’ energy as the basis for a long-term sustainable economy are only limited by the impact on inflation *vis a vis* other national economies—many of which are facing the same challenges and open to the same solutions. In any case, the time has come to reframe current monetary policies such that they better reflect the kind of balance between managing inflation and delivering full employment that operated in the earlier Keynesian era. Back then, far from being a curse, inflation was seen as beneficial in eroding over time the government debt that had been incurred through spending to achieve full employment.

A similar case can be made for rethinking our stigmatising and often humiliating welfare system and the way governments' attempt to tackle social inequality by targeting the unemployed, disabled, work-injured, child-care, aged-care, housing and energy, and retired populations. As argued elsewhere much could be simplified, delivered more humanely, equitably and effectively (perhaps even less expensively) through a system of universal basic income (UBI) as a of right for all, supplemented with a genuinely progressive system of taxation on all income made in excess to the UBI.

Crisis as both challenge and opportunity?

Given the scale of the crises that are being triggered by the climate-driven changes to environments, economies and, increasingly, every-day living, it is perhaps time to think in terms of more radical and holistic changes that put the needs of people before profit and lay foundations for something more sustainable in the future. Such changes to whatever extent and in whatever forms emerge cannot be delivered without policy changes at the national government level. However, they cannot be delivered by top-down approaches alone. As well, we will need bottom-up pressures and practical initiatives that we know are needed and can be delivered now. Initiatives that tailor changes to situations on the ground that engage and involve working people and their communities.

To suggest one small example ...

The argument has been made that Australian energy needs could be met by using existing industrial and commercial rooftop space for photovoltaic solar panels and equally available space for intermediate-scale batteries that together would service the needs of their neighbourhood for a more 'distributed' electricity supply—and, in doing so, reduce the need to expand the existing electricity grid system designed for an earlier era of centralised fossil-fuel generation. The idea is sound. The challenge is getting it to happen at scale—building on pilots and models to roll out a national program. Unlikely without involvement of a range of stakeholders in the enterprises and communities where such systems might be located.

An obvious starting point would be to initiate discussion with the workers in the enterprises—many of whom are also local residents—about how demands for such initiatives might be included in collective bargaining with employers through their unions. Lessons from successful experiments can then be shared with workers in other places and become models for industry-wide take-up. Several unions already support rank-and-file groups exploring adaptations to climate change. An action-research project that worked through these to identify how workers and community stakeholders see the challenge, their ideas for what is needed, and how they can organise for these would seem to be on the cards.

And coming back to my early lesson, pissing downwind, not only avoids a wet mess it also lets me see more clearly the path the prevailing breeze is pointing and aiding me to move with it at my back rather than struggling into it.



Lamb of God

BY CARL GOPALKRISHNAN

EXTINCTION

What the Fig?

The epic adventures of 'Fig' the fruit bat.

MELISSA MCLAY & CHARLOTTE READ

For Fig's sake! What the Fig is going on?

In 2023, articles were published showcasing there were flowers blooming in Antarctica. It became a catch phrase on social media platforms for the dire situation of the global climate crisis. In 2024, another event took place not far from Antarctica that could be seen as another canary in the coalmine for the climate. Or maybe chiropteran in the coalmine.

Not too far from the icy climes of Antarctica a different and yet similarly resonant event happened in Koonya at the Southeastern part of mainland Tasmania. A Grey Headed Flying Fox was found entangled and blast-beruffled in an apple tree by local orchard farmer Dave MacDonald after his dog alerted him with vociferous barking.

Enter Fig.

Somehow the little guy had blown off course in search of food and habitat, caught by the winds of Bass Strait, and made the almost impossible journey from Victoria's Yarra Bend to Tasmania's Koonya, an epic trek of 851 kilometres southward and vastly outside of his normal habitat. At an average speed of 30 km/hour, the top speed for his species, this would have taken at least 28 hours nonstop. Unless he

rested at off-course islands like Muttonbird or Lourah islands, or maybe even boats or bouys, he would have had to fly at least 500 kilometres without a break. Individual flying foxes can fly up to 50 km in a single night to find food like nectar and fruit and are known to take long nomadic flights that take up to a year. But not in one go and certainly not nearly a thousand kilometres outside of their normal habitat.

It was the first time in history that a mainland bat had been seen as far south in Tasmania.

Affectionately dubbed Fig the Fruit Bat, he became something of a Tassie celebrity as the first known fruit bat to grace the Apple Isle. Although native to mainland Australia, they've been steadily moving southwards, especially nursing mothers, due to habitat, food and pollen destruction—a three-step forward and two step-back dance in search of food and in defiance of rising temperatures; often unable to make it back to established colonies.

Poor Fig.

Taken in by local conservationists, Fig was later given a first-class seat in the Qantas cargo hold to return to Tamsyn Hogarth's Victorian-based Fly By Night Bat Clinic in the Dandenong Ranges. Tamsyn cared for Fig in Olinda, along with a clutch of rather

attractive and extraverted single lady bats (you can see them dancing together here), for several months until he was well enough for a soft release back at his old stomping ground, Yarra Bend. No doubt, if conditions hadn't changed, he probably thought he'd have to do that bloody Tassie trip all over again!

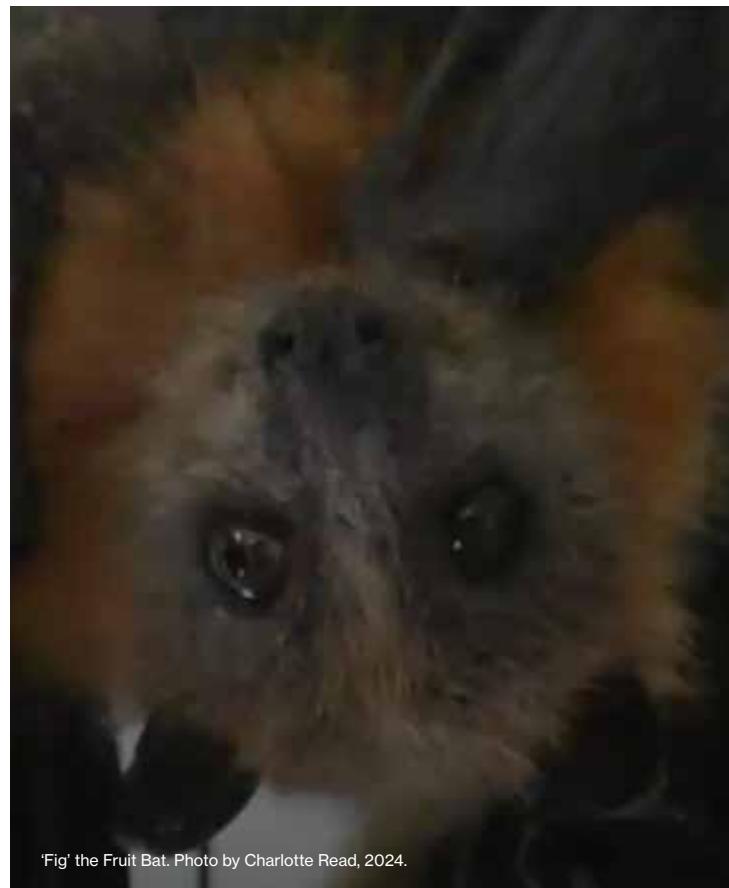
Tamsyn says fruit bats, or more correctly the Grey-headed Flying Fox (*Pteropus poliocephalus*), become nomadic in response to factors like extreme weather pattern changes, climate change, bushfires, deforestation of natural food sources and stress. Extreme weather events and rising heat in southern states of Australia like South Australia and Victoria can see thousands of flying foxes die from extreme dry heat exposure—presaging in some cases mass die-offs that threaten colony collapse. Most are nursing mothers with babies attached and nursing. Extreme winds and storms also throw them out of trees, into powerlines and farm netting, and off course from the safety of their colonies. The past few years have seen a spike in heat die-offs and high wind casualties, sending bats into colder climes where they sometimes have pups presenting with the opposite extreme, frost bite.

Fig, through his dramatic migration last year, has highlighted key issues in bat conservation, who are now listed as 'vulnerable' under the EPBC Act. "What many people do not know," Tamsyn explains, "is that our fruit bats in Australia serve a similar role to bees, nocturnally pollinating flowers and dispersing seeds, and annually migrating through ecosystems for mating and changing weather patterns."

We all know how important bees are to the ecosystem—yet bats do not always receive the same warm welcome in many places due to stigma, though they are just as vital to the health of our natural world. There is a reason they have a superhero named after them, after all.

Another issue that highlights climate change is that the breeding season is earlier than previous years. Pup season is usually in October but breeding patterns have quickly altered and pup births are happening much sooner than expected, with nursing mothers and pups increasingly rescued and rehabilitated for future release

Recent bushfire events like the 2019/20 megafires saw most areas affected, and this profoundly impacted the delicate ecosystem supporting colonies. For example, the east coast of Australia was one of the main areas for blue gum blossoms which can take up to four years to blossom again after fires. This wiped out a major food source for four years, forcing the Flying foxes to migrate in search of food.



'Fig' the Fruit Bat. Photo by Charlotte Read, 2024.

As a consequence, a new pattern of migration arose where they are cutting through central NSW heading west, usually uncharted territory and in areas where extreme dry heat is regular but dire to the species. They have nowhere else to go.

And as they travel unfamiliar areas, another source of life-threatening stress is farm netting, says Tamsyn.

"Netting of fruit trees is contributing factor of fatal injuries that are contributing to their plight because it causes extensive wing damage. This is because tearing of the thin and delicate skin membrane of their wings is almost always unreparable. It's a death sentence." Despite the rising rate of colony collapse, Tamsyn is disappointed by the lack of concern by CSIRO and the Department of Energy, Environment and Climate Action (DEECA).

In March 2024, CSIRO released a paper stating that ten years of monitoring suggested the flying fox population was actually stable! Tamsyn firmly disagrees and worries that the paper unintentionally signals that we can rest on our laurels when it comes to grey headed flying foxes and the other three macro bats native to Australia. With waning support and funds from government, this leaves native bat conservation mainly driven by the compassion and

concerns of the volunteer network and public—people like Tamsyn.

A lack of concern by ministers seems to come from bad publicity from media and NIMBY residents who portray the bats as a suburban pest and a menace to agriculture without understanding the vital role they play to the greater ecosystem. This is partly historical.

In the 80's bats took to colonizing the Melbourne Botanical Gardens due to destruction of their habitat by suburban sprawl. As their numbers grew in urban areas, so did the complaints by inner-city NIMBYs. Various and ineffective methods such as dog whistles, bin banging, and pepper spraying of trees all failed to make them move. The Victorian Government and The Botanical Gardens decided a cull was their next step. A battle between conservationists and government took place with the State Government having to find a more holistic approach to moving the colony. It was 2001 that the use of loudspeakers was able to deter them from roosting in the area and to encourage them to move to their new home in Yarra Bend.

Yet from this short-term solution emerged a resistance to funding further work, to the extent that next to no funding is now offered towards proper research and rehabilitation.

Tamsyn also mentions that any critique of tree netting by DEECA is mainly related to their impact on native birds like lorikeets, which are more marketable and a far 'cuter' species. Tamsyn suggests that mainstream and previous negative narratives of the flying foxes being a pest, or carriers of disease, has had a lamentable and permanent effect on this beautiful species' reputation.

She pointed out, however, that without bats more beloved Australian species like koalas would be severely threatened as it's the flying fox that pollinates the gums that are vital food resources for koalas and a host of other species. If bats fail, it becomes a ripple effect throughout an already stressed and delicate ecosystem.

As Fig assumed the role of trailblazer, he has finally reignited questions and concerns from researchers and the public alike. Fig's migration reverberates with profound ecological implications, hinting at the interconnectedness of ecosystems and the forced adaptations wildlife are making in the face of environmental shifts. The first time such concerns were collectively explored—the slower southward migration across myriad species—was in Tim Flannery's seminal 1994 book *The Future Eaters*. Now we see the same effects in more dramatic journeys.

Such a vast journey may be inexplicable when investigating normal bat behaviour and migration routes—however Fig's rare journey hints at an even greater catalyst behind his motivations to go so far South. It begs the question: what hidden threats face our wildlife in an age of accelerating climate change and what threats therefore face *us*?

Despite rising threats from other global geopolitical issues, climate change remains this era's most prevalent threat to biodiversity on Earth, including humanity. Our actions as a species do not align with the survival of the planet, and our duty of care has been called out as lacking. Regarding climate change in Australia, the country has been experiencing significant impacts due to rising temperatures, altered rainfall patterns, and more frequent extreme weather events. These changes have led to challenges such as prolonged droughts, increased bushfire activity, and utterly dystopian threats to biodiversity.

Such challenges force our wildlife into extreme conditions, including pushing a tired fruit bat to the southernmost regions of the globe. Our unique mainland Australian ecosystems have become threatened with increasing rates of megafires, severe storms, altered rainfall patterns, devastation of trophic levels through extinction—all putting entire ecologies out of balance. A changing climate spells possible extinction for many species. Let us hope this will not mean the same for our beloved night bees—the fruit bats.

Want a video of Fig at [Fly By Night Bat Clinic](#)?

EXTINCTION

The Climate Rebels

PROF PAUL READ

Extinction Rebellion founder, Roger Hallam, says if you've not been in jail, you're not doing your job properly. Here we talk with some people who are doing their job properly on behalf of the planet—Dr Ginny Barrett (Extinction Rebellion) and Kyle Magee (Frontline Action on Coal).

Both have been in jail for a cause. They're not afraid to put their name to their cause. They don't need lawyers and highly paid spin doctors to make them look like they have integrity.

They are the climate rebels.

We often see them howled down by the conservative right for disrupting traffic or ministerial events, hurling paint on artworks, shoveling coal from trains, glueing or chaining themselves to bollards, walls or trees, smashed into divvy vans, handcuffed behind their backs, beaten, rounded up, shouting their message whilst pushed to the ground. The climate rebels. Who are they?

Melbourne-based Kyle Magee has two young daughters; they are the reason he fights and the reason he's spent a good portion of their childhoods in jail. Just before Christmas 2021 he and Franz Dowling, both supporting Frontline Action Against Coal (FLAC), boarded an ADANI coal train with a

pair of golden-painted shovels and spent the next days and nights shoveling up to 80 tonnes of coal over the side under the glowering eye of the local Queensland constabulary, who could do nothing until reinforcements arrived.

The local cops had to wait a good 24 hours for trained operatives to deal with them, deployed all the way from Brisbane. In the meantime, Kyle and Franz just kept shoveling, day and night, dripping with sweat and shirtless. Buzzing around the country, pics on social media made them the overnight pin-up boys of the anti-coal movement.

"We gave 'em their golden shovel moment," said Kyle. "In spades."

Defiant to the end, he was refused bail but took his battle to the Supreme Court. This wasn't the first time. When Scott Morrison was refusing to go to COP 26 in Glasgow, Kyle and comrades 'broke in' to the coal port at Hay Point and 'locked on' to stop the conveyor belts. To 'lock on', protestors use a metal tube with a right angle and cable to the wrist. Authorities are forced to deploy trained operatives called a cut-crew to dislodge them. First, they cover them in flame retardant and then cut through the metal elbow and cables with an acetylene torch.

"It all takes time, but it shuts down the operation for long enough to make a point," says Kyle.

In most operations, Kyle works with supporters, drivers and spotters from FLAC, usually from a private base. They are amazing and dedicated people, he says. During one of his stints in the Townsville watch house, supporters ran crowdfunding to help him make bail so he could see his daughters for Christmas.

As well as being in jail 10 times across a total of 72 days, Kyle has been fined close to \$1 million, one of the first times for spray painting over a video advertising board at Flinders Street station, where the cost to replace the board was \$250,000. Kyle engaged Legal Aid lawyers, refused to apologise, and was locked up indefinitely until his case went to the Supreme Court. He's also painted over billboards and tram stops from St Kilda to Fitzroy, often accompanied by a film crew to post his protests on Instagram under 'democraticmediaplease'.

"Yes, I worry about leaving some financial safety for my girls but here's the thing. The reason we need money to make our kids safe, the reason we buy into the whole mess of this atomized 'piece of shit' society is because we haven't made it safe for them or ourselves at a structural level. I'd rather fight for a safe democracy than sell out and feed the machine."

"The central problem in our whole political discourse is control by corporate capitalism, and they control the narrative through media and advertising. So, my main strategy is to attack this at the source. We shouldn't have advertising in public spaces, physical or online. Messages in the public space should be mandated to serve democracy, our future and our people, and not the 1%.

"Here's an irony—Jeff Kennett opens up Victoria to pokies and casinos and then has the audacity to head up Beyond Blue. What a joke. We've been reduced to a system that makes everybody want to kill themselves—inequality, warfare, destruction of other species are all so interlinked now that we can't separate them. We pretend we have a democracy, but we don't anymore, and the first thing we have to do is reclaim the narrative back from corporate greed."

"Short of the bastards shooting off to Mars or living in some sort of weaponized biodome, we only have one planet and the 1% will need to learn to share."

Kyle says jail isn't so bad but there are a lot of broken people inside and a culture of hypermasculinity, so you need to shrink yourself down and not inflame people. He says he's tough enough to cope and will carry on the good fight on behalf of future generations.



Kyle Magee shoveling 80 tonnes of coal from an ADANI coal train in Queensland.

"I'll keep fighting and going to jail. And they can't lock me up for what I might do in the future."

On the other side of the world, UK activist Dr Ginny Barrett agrees with Kyle and has even received actual training for imprisonment by Extinction Rebellion. Unafraid to speak out under her own name, the former medical scientist is now Roger Hallam's unpaid assistant. Like Kyle, there is no funding for the work she does. Since ditching academia for motherhood and planetary rebellion, she's been arrested three times in as many years. Her longest detention was in 2019 for walking peacefully past Downing Street with a sign that said 'Just Stop Oil'.

She has no issue with the police. "They're forced to do the work of billionaires. Forced."

"On that day back in 2019 each of us were detained by five arresting officers. Rather than fighting and spitting and carrying on, I just spent the four hours talking to the officers about why we do what we do. They were genuinely interested, and I remember more than once their eyes welled with tears as we spoke the truth about what's happening to our planet. Most of them care as much as the next person. They're not always the enemy—just people like us."

Ginny grew up in the same little village where she lives today with her family. An activist of five years now, she was always conscious of trying to live sustainably but it was hearing Greta Thunberg speaking in 2018 that shifted her life's course. She remembered thinking "this just isn't right!"

"The government subsidises fossil fuels, they make record profits that goes to shareholders and billionaires, and the future of our children is destroyed at the Planet's growing expense."

"I think it really hit home when the UK Prime Minister's wife raised \$1.5 billion as the PM released 100 new fossil fuel licenses, vowing to 'max out' the North Sea!" As it turns out, in mid-2023 just two months before PM Rishi Sunak opened hundreds of new licenses for oil and gas extraction in the North Sea, an IT firm founded by his father-in-law signed a \$1.5 billion deal with energy giant BP, one in which his wife had a £400 million stake. What's more the PM appointed one of the family's other clients to his business council, Shell CEO Wael Sawan. Astonishingly the UK PM merely dismissed it as 'not of legitimate public concern'!"

Says Ginny: "They don't even pretend anymore. It really opens your eyes to your own country's corruption. Not that long ago I had half a million pounds in research funding and I just realized I was playing my part as a cog in a system that's rotten to its core."

So she left. Upended her entire life to fight for the Planet and her children.

"As a species we are carrying so much grief now. My daughter says if it can be fixed, why don't we just do it? I think the answer is greed."

"I'm often cancelled by the local councils or people who own the venues for talks I give to villages on net zero. I make no money. But then I see footage of animals washed away in torrents of fast-moving floodwaters, or of native animals stumbling into flames, and I know I'm doing the right thing. One of the saddest things I've seen, one that not many know

from last year, was the mass die-off of baby penguins in Antarctica. Not one pair managed to breed in one of the colonies, 10,000 of them died." Due to a warming climate, the sea-ice underneath the chicks melted and broke apart before they could develop the waterproof feathers needed to swim in the ocean. Ironically, the warmth meant they died of the cold. "The fluffy snow melted to freezing slush and the babies simply couldn't survive."

Ginny pauses.

"Everybody knows the right thing to do; we just need to do it. It only takes a small number of people to make a big difference."

You can start by reading Roger's book, *Common Sense for the 21st Century* (2019), or Michael Blencowe's *Gone: Stories of Extinction* (2022). Ginny says the move away from consumerist culture is not that hard as we've lived differently for millennia and it's not that long ago that we lived sustainably in small villages with permaculture, people growing their own food.

She recalls a documentary where the elderly were interviewed in the 1950s about how life was in the late 1800s. "They had two pigs, they'd walk five miles for a swatch of fabric to make clothes and sew their dresses." Another important aspect, one that resonates with the message of another author Pat Vickers-Rich, is the need for community—"to be sociable". Ginny says we need to go to the local arts festival, connect locally, support local people, be part of the community.

"By fighting I don't feel helpless anymore—I have hope—and I want to note my gratitude here to good people like Roger. Yes, he's a fighter but he's also great fun—he laughs a lot and when it gets hard I just have to remember that a hundred years ago people fought world wars and all I have to do is go to prison—it's no hardship."

"The memory of people who fought wars for us and lost their lives for us—we can't waste that."

EXTINCTION

Extinction Rebellion says we need a 'Little Revolution'

WITH ROGER HALLAM

In 2023, Roger Hallam was clapped in irons, secretly running a weekly podcast from a UK prison called *Designing the Revolution*, and patiently waiting for the state to silence him. Somehow he got through 50 episodes.

“I’m a bit Celtic,” he says.

As 40,000 people registered interest, Roger conceived of a more global reach through R21C—revolution for the 21st century.

“This is a seminal moment in the human story.”

“Gone are the days when we can rely on Greenpeace and others to sort the issue. Nope. You get to your late 50s and realise there’s nobody else but you.”

“People are full of grief. They already know the Paris Agreement is failing to keep global warming below 1.5 degrees. Their biggest issues are becoming fires, floods and food.”

“So the central proposition, once we realise that climate disruption is locked in, is what’s next? The global south will fall under the ravages of debt and climate impacts while the neoliberal regimes in the north will collapse under inequality and greed.”

“It’s not doomsday yet, but it’s way more than a few hot summers and the next step needs people to assert their stewardship of the planet and their own communities. The question is how? We can either do it honourably and without violence or we can let fascism take over.”

The biggest social, economic and environmental issues are not being resolved because the democratically elected governments are no longer in control—capital is driving short-termism, people are becoming increasingly disempowered and angry, and the result feeds fascism, which nobody wants.

“I think collective deliberation supported by civil disobedience is preferable to fascism,” says Roger. “With a little bit of support to localised assemblies.”

The idea is revolutionary change without resorting to blood on the streets; instead supporting regime and constitutional change informed by citizen’s assemblies that support collective deliberation on local issues, that collect and represent the local voices of people, place-based, inclusive, and driven from the bottom-up.

“It’s a different form of democracy led by civil society.”

The idea is to create citizen’s assemblies in each local government area to decide the future of Australia and to feed up local demands to put pressure on state and federal governments. It involves a lot of inclusive listening, followed by a list of inclusive demands. But it challenges the current regime precisely because democracy is being suborned by corporate interests, short-termism and the personal careerism of government ministers. If we do this right, there will come a time when we can rightfully claim to be more representative of the

people than any government owned by corporate interests.

“It will fail again and again,” says Roger. “But it will eventually succeed.”

Roger points to countless examples throughout history, one being the people’s uprising in Bolivia in 1820 that failed no less than six times. More recently, the Irish set up citizen’s assemblies on reproductive rights and took only three months to make changes by providing a forum which allowed people to speak openly in small groups. Another example is the village of Hull in Essex, in which Extinction Rebellion assemblies set up an alternative local council with 70 people focusing on 10 reform issues. After a year, these ordinary people stood for local council and won.

Roger points to last year’s failure of the Voice Referendum and says part of this alternative system makes certain the voices of First Peoples are heard. In post-colonial nations, we must give structural voice to all minorities, not just tokenistically due to DEI policies, but in ways where real change gives power to minority groups across the board rather than a small, elite minority within a broader minority. One way we need to do this is to randomise sortition within minority groups to overcome post-colonial misrepresentation.

R21C is preparing a global report to help build citizen’s assemblies across countries, including Australia and New Zealand as we move into decades of crisis stimulated by climate, inequality and species extinction. When the big crisis comes, as he says it will, R21C intends to be ready, as Lenin was in WW1.

“History is full of these examples,” he says.

“Unfortunately, representative democracy is putting in place governments that fail due to commercial and corporate control, so we need to reinstate a form of democracy that speaks for the people. Civil resistance is great, but it needs a pincer action that establishes alternative government—people’s assemblies supported by NGOs and charities that champion demands from the local level. At this point, we can assert that we are the real voice of the people. Of course, government will say no, we will fail over and again, but the alternative is fascism.”

Roger says it could work in Sydney, for example, in which LGA based assemblies, working with NGOs and charities, form a large democratically driven movement that pushes, say, five key demands to government. It might be taxing the rich, antipoverty or antiracism, domestic violence and so forth. But if all come together to represent the people we can occupy local councils and governments to force

change.

Roger says what he wants is a ‘little revolution’. He says the kind of incrementalism argued by organisations like the Fabians is simply not working. So a small-scale revolution is needed at the local level supported by a modicum of centralisation and a closed ecology in which coordination strengthens local alliances among people, NGOs and charities.

“They need to share and reinforce one another’s plans through centralised support because otherwise the atomisation of NGOs is a disaster for change. We need global movements of a similar nature to those before 1989, wherein each organisation and assembly can assert and retain their identities (we’re not Communists!) but at the same time coordinate their efforts.

Roger says the assemblies will need to meet weekly, guided by a centralised timeline that strategically integrates the needs of different actors and organisations. If managed well, with a focus on coordinating demands and timelines rather than pushing top-down policy, citizen’s assemblies can transform social conflict driven by inequality (and inevitably deepened by climate change) to avoid the rise of fascist degeneration. Part of it requires empowering locals with training them to deal with kickback and even jail. Another part is ensuring the process is given precedence over the subject—that is, the information about climate change and inequality is actually less important than the emotional reaction it incites.

“As I said before, people are full of grief. We need to give them a forum to express it, work through it and work on solutions. Giving them back agentic power to make change is the only way out of despair.”

Another important aspect is making sure the framing of the issues give people cultural permission to openly talk about their own grief and anger without censorship. They must be given permission to explore the information, but beyond this, acknowledge what is really happening, have their grief validated and supported, and then provide them with channels for revolutionary change. Even though it’s local the momentum can’t be atomised. It needs to be channeled into a global energy for real world-wide transformation.

“Let’s acknowledge the objective fuckedness of the situation and then do what’s needed to help people turn it around.”

“It gets to the point where the people have every right to say, and loudly, ‘I did not vote for this!’”





EXTINCTION

The Looming Catastrophic War on Life in the Deep Sea

CAPTAIN PAUL WATSON

I'm going to step back in time to April 1977 to Pier 32 in Honolulu where I watched a cargo of potato sized rocks discharge from a Liberian registered mining ship named the Sedco 445.

John L. Shaw, the President and General Manager of Ocean Management Inc. gave me a guided tour of the Sedco 445, first ship to carry out a deep-sea mining operation.

The Sedco 445 had just returned for a mining site 800 to 1,000 miles southwest of Hawaii where it had brought up a continuous stream of material from a depth of 17,000 feet or three miles.

I picked up a rock that resembled a black potato and Mr. Shaw informed me that each of these rocks took over 200-million years to form on the seabed, and contained up to thirty different minerals with three quarters of the content of each nodule being nickel.

According to Shaw, the nodules formed over millions of years as falling debris like sharks teeth or fish bones acted as a nuclei to gather trace minerals. The estimate is that the nodules grow about one millimeter every thousand years and in some areas of the benthic seabed there are billions of these potato sized rocks and each one is teeming with minute marine organisms.

The exploratory voyages were inspired by John L. Mero in 1965 with his estimate of vast ferromanganese (Fe-Mn) nodules in the Pacific Ocean. He speculated that the Pacific seabed contained a limitless supply of metals including manganese, copper, nickel, cobalt, lithium, zinc and molybdenum. That was enough to make huge mining interests salivate with the possibilities for exploitation.

Since 1965, Oceanographers estimated that these nodules could contain up to two trillion tons of mineral ore, more than all the deposits to be found on land.

On April 19th, 1977 I watched the Sedco 445 depart from Honolulu to return to the mining site to recover a second cargo of nodules, experimenting with a second method of nodule recovery.

The first test was successfully carried out with a system of hydraulic pumps. The second test created a wet vacuum to suck up the nodules from the ocean floor.

I expressed my concern to John Shaw and asked if they had conducted any research on the possible ecological damage. They hadn't.

His primary concern was economic, and he told me that the current price of nickel could not justify full scale exploitation.

"We have the capability now," said Shaw, "but aside from the political delay, the current nickel market is down. We can afford to wait."

In fact, in 1977, it was in the interest of INCO (International Nickel Company) to wait. A 1977 report from the U.S. Treasury Department reported that, "INCO is out there as a hedge against what would happen if all those nodules flood the nickel market. INCO probably wants to stifle ocean mining.

INCO as the dominant world company depended on maintaining control of the international nickel supply.

INCO's vice-president at the time in charge of ocean mining, Alfred Statham confessed to the U.S. senate committee that, "the fact that we are the only consortia may give us a different perspective."

Quite willing to do battle in 1977 with INCO were four formidable consortia all separately attempting to grab a large portion of oceanic territory for themselves. In addition to INCO's longtime rival the Rothschild owned Le Nickel SA., three newcomers to nickel mining entered the picture. Kennecott Copper Corporation, the U.S. Steel Corporation and Lockheed Aircraft.

U.S. Steel, the largest nickel and manganese consumer in the world was hopeful that deep-sea mining would provide two essential alloys to enable the company to break off its dependency on INCO.

Lockheed the operator of the Glomar Explorer, the ship built by Howard Hughes for the CIA was hopeful that deep sea mining being a highly technological industry would yield large government subsidies.

My interest at the time was the ecological impact.

Nickel composes 1.5 percent of the nodule content. 70% of the recovered material is worthless waste.

Mr. Shaw told me that "nodule mining is environmentally safe, there are virtually no environmental side effects."

He added, "We had Federal inspectors from NOAA (National Oceanic and Atmospheric Administration) with us, they witnessed our operations and noted approval. They observed the situation and found no serious environmental problems."

However, Dr. Robert Burns one of the oceanographers who accompanied the Sedco 445 explained that, "If I were he (Shaw) I'd probably interpret our findings that way. It is of course in his interest to do so."

Burns explained that only one actual deep-sea mining operation had been observed, the very one he had recently observed on the Sedco 445. Burns said that it was too premature to make a definite statement one way or another.

"It was a short-term effect to scale. There was a lot of muddy water. We had not seen any sign of pollution but in a large-scale operation, we can't yet say what the effect will be. Anyone who says otherwise is just whistling dixie."

Other highly reputable and respected scientists at the time were in fact whistling their opinions.

According to a report published by Yale oceanographer Dr. Karl Turekian if the waste is discharged on the surface, the residue may take years, even decades to reach the bottom. Ocean currents will spread the dust, silt, and debris over wide tracts of the Pacific. Turekian estimated that if all the then planned mining projects were allowed to proceed and are in operation by the mid-Eighties that by the end of the century, several hundred thousand square miles of the Pacific could be contaminated.

Fortunately for economic and political reasons that prediction was not realized.

Yet now nearly half a century later, that threat now has the potential to be unleashed.

Metal tailings from the crushed nodules could be consumed by fish, whales, and other sea-life with potentially harmful effects. Humans would be susceptible to heavy metal poisoning by consuming fish.

The slowly sinking sediment with adherent bacteria would consume oxygen in the deeper oxygen scarce benthic zones. The resulting competition for oxygen would have a detrimental effect on organisms living in such an environment. When the sediment finally reaches the seabed, three to four miles deep, the blanket of sludge will asphyxiate most life forms

dwelling there. According to a study conducted by the Lamont-Doherty Geological Observatory of Columbia University, there could be serious consequences. The study pointed out that it would be unknown how long benthic species would need to repopulate devastated sections of the sea floor. It would also be unknown how the depletion of benthic life would impact the food chain through the entire oceanic eco-system.

Another serious concern is the possibility that dormant spores or bacteria having lain undisturbed for eons could be released at the surface among lifeforms which have no immunity.

I spoke with Dr. Roger Payne in 1977 about these concerns and he added his view that heavy sediment could disturb the transfer of sound waves beneath the surface of the sea, affecting whale communication and migration disrupting the social systems of whale species.

If the ecological concerns were falling on deaf ears, the potential consequences for the United States Navy were alarming to the US Defense Department. If whale and dolphin sonar is affected, so too would bionic sonar employed by the US Navy. This technology designed to mimic sea sounds, especially whale sounds to avoid enemy detection.

The sleeper missiles that were placed on the ocean floor by the Glomar Explorer would also be affected and possibly rendered inoperable. The high frequency signals that would launch the missiles could be absorbed or deflected by drifting sediment.

In August, 1977, the Assistant Secretary of Defense David McGilbert told a Senate Committee that his department could see no immediate need for mineral resources from the seabed.

"The Navy," he said, "does not relish the prospect of having to defend the bulky and slow-moving mining ships on the high seas."

Gilbert told the Senate that the Navy wanted the Law of the Sea to succeed. He also made it clear that to anger the third could result in the closure of essential straits and canals that naval ships use.

In 1977, the government of Hawaii was unconcerned about ecological consequences. Governor George R. Ariyoshi said the project would create jobs and investments. That was his sole concern.

John Shaw told me that "Hawaii is certainly geographically best situated, and I've certainly been impressed by the attitude of the industrial development people."

In 1977, the Hawaii state department of planning prepared a paper called The Feasibility and Potential Impact of Manganese Nodule Processing.

According to this study the nodules could be transported in barges to Hilo harbor and pumped in slurry form through a pipeline, the waste would then be pumped back to the harbor and loaded in barges to be returned and dumped. The report foresaw no significant impact on the environment except in the case of an accident.

In addition to minimizing and downplaying the impact on the oceanic environment the report completely ignored the fact that metal refining especially nickel refining requires vast amounts of energy and water and produces toxic fumes. A visit to the largest nickel mine in Sudbury, Ontario, Canada is all the evidence needed to see how toxic nickel refining is.

That is what I reported on in 1977 and for the last half a century, I have been watching the ever-loomng threat of deep-sea mining. To date, the deep-sea environments have been relatively protected by the high costs associated with large scale industrial development, the concerns of the military and increasing awareness of the threat to deep sea ecologies that benthic mining will most certainly cause.

However, things are changing and not for the good.

Since 2001, the International Seabed Authority (ISA), an intergovernmental body in charge of regulating deep-sea mining in waters beyond national jurisdictions, has granted 31 exploratory licenses to private companies and governmental agencies. The organization is unlikely to approve commercial mining applications until its 36-member council reaches consensus on rules regarding exploitation and the environment. Member states have set a 2025 timeline to finalize and adopt the regulations.

Today, the technology has advanced considerably since 1977 and the price of these metals has risen sharply providing both financial motivation and accessibility.

The mining industry sees a vast area with trillions of "rocks" easy for the picking. What the industry fails to see or refuses to see is that this is a vast living finite eco-system that has evolved over hundreds of millions of years. These nodules are not renewal and mining will eradicate exceedingly large eco-systems, the machinery will produce high decibel sound waves that will have a devastating impact on living organisms

and the silt will smother the life that survives and it will never recover, at least not for a few hundred million years.

In addition, sucking up the rocks, the industry is looking at scraping the sides of undersea volcanoes to extract the cobalt crust and digging deep into the benthic mud to extract massive sulfide deposits around hydro-thermal vents.

Deepsea mining will cause more destruction on the planet than the cutting down of Amazonia and Indonesian rainforests. But it will be done with no visible scars where the impacted eco-systems will remain hidden from view and will become huge extensive invisible dead zones and the impact on the planet's atmosphere and ocean ecology will be immense.

How will it impact the already diminished populations of phytoplankton which provides up to 70% of the oxygen in the atmosphere? How will it impact the already diminished populations of krill, the foundation of the food pyramid in the sea? How will deep sea mining influence climate, the movement of currents and the migration and viability of sealife? The industry has not answered these questions because there is no answer that they will acknowledge because such answers will expose them as harbingers of global destruction.

At present there simply is no regulatory framework for mining inside or outside of economic exclusion zones.

Already territorial disputes are emerging. Norway and Russia both want to exploit the seabed of the Arctic Ocean. China is hungrily exploring how to exploit the South China sea which will cause problems for the Philippines, Vietnam and Japan and this jockeying for control is on a planet where there are already over 100 unresolved maritime disputes.

And thus, we can now see a new threat to the stability of the life support system we call the sea, where acidification, species diminishment, plastic, noise, and chemical pollution are already seriously straining the biological processes that keep the ocean healthy.

It appears that full scale deep-sea mining could begin by 2026 and if it is allowed to do so, the global consequences could be catastrophic.



EXTINCTION

Ice Maiden Sets Sail for New Voyage on Climate Action

WITH LISA BLAIR

Alone in a 15-metre boat awash with crashing waves, Lisa, seasick and exhausted, battled seven metre swells and 40 knot winds a thousand miles south of Cape Town, when, deep in the night, her mast snapped and all was lost. Refusing to issue a may-day, she issued a pan-pan alert to Cape Town search and rescue that she'd suffered an incident. Aged 32 at the time, Lisa was on target to break the record for the solo circumnavigation of Antarctica.

That was 2017 on board her 15 metre vessel named *Climate Action Now*.

“I thought I was going to die.”

Her story is being told in the 2024 movie *Ice Maiden*, shortly to be released at the end of June for its world premiere at the Doc Edge Film Festival in Christchurch, New Zealand. [Here's the trailer](#).

Ice Maiden is a feature length documentary charting the uncompromising determination of Australian Queenslander Lisa Blair, who became the first woman in history to sail solo around Antarctica, a journey of 16,000 nautical miles in only 92 days. She's broken three world records in almost as many years—fastest solo circumnavigations of Australia and Antarctica, first woman in both cases.

Lisa's journey began at only 25 years old when she got the job as cook and cleaner on a in a clipper boat race to Hawaii and witnessed first hand the sheer volume of garbage amassed past the coast of Indonesia and the South China Sea.

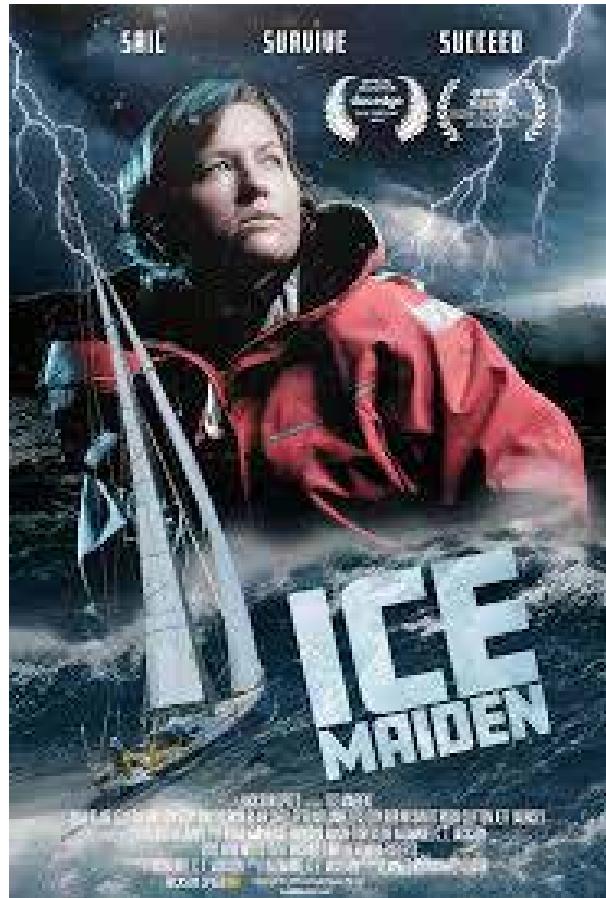
“There was so much rubbish we had to take shifts to lean over the bow and push it ahead of the boat.”

And this was nowhere near the Great Pacific Garbage Patch—a floating gyre of plastic in the North Pacific roughly the size of Queensland and 2000 metres deep.

“No, this was just North of Australia and awash with the detritus of consumerism, a heart-breaking thing to see.”

Lisa began work with the Australian Institute of Marine Sciences to start collecting microplastic samples on her voyages. Her microlab collections on ocean health now provide the world's most comprehensive data for Antarctic waters

They found plastics in every single sample they collected. Even at Point Nemo—the most isolated place on Earth roughly 45-60 degrees in the Southern ocean—there was more plastic on average than all other areas sampled. They found 58,000 plastic particles for every Olympic sized pool of water, with 35% degraded to the more dangerous secondary fragments, some containing microbeads from banned skincare products, and 64% containing microfibres from clothing textiles.



'Ice Maiden' 2024 Documentary on SBS

“Even though it's the most isolated piece of water in the world, it's not pristine. Fed by the ocean currents, it collects swathes of rubbish from all around the globe. So, what we're doing on land is affecting the most distant places in the ocean.”

Lisa explains that the average Australian household releases 300 particles for every load of synthetic clothes washing and this is released into waste water that ends up in the sea. Multiply this by the number of Australian households washing clothes every week and the plastics released amount to 14 trillion particles every year.

Lisa asserts we need to mandate microplastics filters on every new washing machine and we must apply a Pigovian tax on all virgin plastics. A third measure she suggests is complete transparency on waste recycling.

“People try to do the right thing with recycling but a lot of councils don't have the infrastructure to recycle properly, a lot of disinformation gets shared, and people just give up because they can't rely on their councils to do anything but dump recyclables in landfill.”

Lisa says councils and LGAs should provide full public disclosure and states could incentivise recycling with Clean Street Awards. As to secondary plastics, Lisa says a tax on new plastics would incentivise recycling such that second, third and fourth uses would become increasingly cheaper to reuse and the taxes raised could be used to support recycling infrastructure. At present, it remains cheaper to make new plastics than to recycle; so a tax would go a long way to disincentivising putting more rubbish into the natural system.

Another huge source of microplastics is car tyres. Fully 30% of microplastic sources now come from erosion of car tyres in the normal course of useage on the roads. As recently as two years ago it was found that 70% of people now have plastic in their blood and last year it was found that geological samples from thousands of years ago contain traces of plastics.

Lisa says the average fish will be 18% plastic by the year 2050, adding a new dimension to the claims that there will be more plastic in the ocean than actual fish by the same year.

“This is not that far off,” warns Lisa. “There is a crisis in plastics choking our oceans and we’re effectively killing ourselves.”

The next big issue for Lisa will be fibreglass. She says there are 35.4 million boats reaching the end of life in the coming year and some sort of free disposal amnesty is needed to ensure glass fragments don’t end up adding to the plastics crisis.

At present, they are mostly scuttled or abandoned. About 100,000 are abandoned in Europe every year. A local study in an oyster farm in Chichester found they had to shut down because there were 7000

shards of fibreglass in every one kilogram of oysters, merely because the farm was co-located with a nearby boat launch.

Lisa says boats will need to be built from alternative materials in the near future. “Such materials do exist—volcanic fibre and bio resins can replace fibreglass and liquid epoxies to build more ecologically friendly boats.” Volcanic Fibre (otherwise known as Basalt rock) is 10 x stronger than fiberglass but only 15-20% more costly and holds much lower environmental impacts.

Working on a vision statement to be launched in late June in time for the Ice Maiden release, Lisa outlines her next voyage. She now aims to set yet another world-first record, as the first person in history to sail solo, non-stop, and unassisted around the Arctic, passing through both the Northwest Passage and the Northeast Passage, in one season. Sadly, this project is only possible due to the continued impacts of climate change.

Building on the citizen science research she undertook during her Antarctica record, Lisa also aims to complete an array of citizen science projects throughout the record, as well as develop and build the required vessel from Volcanic Fibre as a test case. Lisa’s vision is to coordinate a global collaboration between industry professionals, universities, researchers, and passionate professionals. The idea is to provide a proven alternative to fibreglass vessels, including the end-of-life closed-loop options and environmental impact assessments, and then educate through storytelling and using the entertainment narrative of Lisa’s world record around the Arctic Circle.



Tree of Life

BY CARL GOPALKRISHNAN

EXTINCTION

A Voice for Nature

The Australian Biodiversity Council outlines the depth of the extinction crisis

AN INTERVIEW WITH PROF BRENDAN WINTLE

Although deeply interconnected with climate, the seriousness of species extinction has not yet reached the public consciousness. Over the past 20 years, the climate wars have chewed through so much political bandwidth that species extinction has been largely ignored. And yet, the idea that we are experiencing the Sixth Mass Extinction is now accepted by a growing number of scientists, 70% at last count. According to peer-reviewed literature species extinction is running at 1000 times the natural background rate and 70 times that of the last Mass Extinction. This occurred 65.5 million years ago and spanned a few thousand years, wiping out 75% of the planet's biota. By contrast, and damningly, the current extinction event has wiped out about 25% in the space of a few hundred years.

Brendan Wintle, Australia's leading champion for biodiversity, says the Threatened Species Index developed by the TRSH hub that he led showed Australian birds, lizards and plants had fallen by 50-70% since 1980, and this maps onto the global Living Planet Index by UN's Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (headed by Prof Sandra Diaz). Brendan says that 85% of the world's wetlands have been lost

since the 1700s. Roughly 25% of all known 8 million species are at risk of extinction, not including bacteria adding another 1.7 million.

"In Australia, there are now more introduced plants and animals than native living on the continent. About 19 of 86 major ecosystems on the brink of complete collapse."

"Extinction is forever," says Brendan, "and it's deeply interlinked with climate."

For example, Brendan explains as just one example that some of the dominant species in the Alpine forests of the High Country need at least 20 years to mature. "The problem is that the return rate for megafires has shifted from every 80 years in 1910 to every eight years since 2020. There's just not enough time for ecologies to recover. What's more, Ash forests hold carbon and filter water, so collapse then feeds into the climate crisis in the opposite direction."

Similar issues afflict marine ecologies because of coral bleaching or the similarly climate-induced rapacity of spiny urchins creating urchin barrens along Australia's coasts. "As the urchins march southwards, they devastate the kelp forests in which all our major marine species live, grow and reproduce. Beneath the waves we have underwater tracts of

devastation that, were they visible above the surface, would immediately incite public outrage akin to what we see when vast tracts of land are razed by fires.”

The key threats, says Brendan, are habitat loss from major landclearing for urban development and agriculture, combined with invasive species. Cats, foxes and rabbits, and plants like lantana and black berries, are the age-old culprits, and we still need stronger laws and funding to contain them, says Brendan.

History of the Biodiversity Council

The Biodiversity Council has emerged victorious after the coalition government’s secrecy and mishandling of the former Threatened Species Recovery Hub, of which Brendan was director.

“When it came to the recovery hubs, we lost,” says Brendan. “At the time, Sussan Ley removed seven species recovery hubs. You can see the background to that work in the documentary, *Extinction Nation* (2019), and in a *Four Corners* expose I contradict the Minister directly. The program ended in 2020 after all the work we did on the species impact of the megafires. Since 2020, we’ve lost 7 million hectares of habitat from fires, coal mines and clearing, roughly the size of Tasmania. And in 2021, the State of the Environment Report was sat on for months by Sussan Ley and Scott Morrison precisely because it highlighted their lack of action in the midst of an election.”

Not to be held back, Brendan and colleagues pushed ahread with The Biodiversity Council, which evolved after two successive reviews of national environmental laws and a host of political mishandling leading up to the present day and the upcoming election promising to do battle over energy and climate. The two major reviews included the Samuel Review submitted in the latter portion of 2020 and the State of the Environment Report of 2021, withheld from publication by the coalition government of the time.

We had a conference in 2019 that drove the development of the Biodiversity Council. After delivering a plenary session on Australian land conservation, Brendan was approached by the Ian Potter Foundation and asked what’s next.

He replied ‘A voice for nature!'

With the support of the Ian Potter Foundation, the Council was set up with 39 councillors, about one third representing universities with evidence-based expertise that was place-based—for example, everything from deserts to the Murray Darling, from

kelp to the Barrier Reef—and a strong emphasis on about one third representing First Nations.

“We needed experts who fully understood deep ecological contexts supported by another two thirds representing law, economics, social sciences, anthropology and culture—the broader ‘people’ aspect in ‘people and place’.”

We were focused on good planning at the regional scale, underpinned by good data, to help improve the efficiency of development approvals and get better outcomes for nature. This aimed to expedite the recommendations of the Samuel Review whilst addressing the parlous state of the nation’s ecological reserves outlined in the State of the Environment Report.

The Samuel Review was the statutory review of the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) commenced in 2019 under former competition watchdog head Professor Graeme Samuel AC and an expert panel. It found successive governments had failed to stem the decline of Australia’s wildlife and called for an overhaul of environmental protections—stronger laws to protect nature.

The Nature Positive Plan of 2022 promised strong environmental laws to address the extinction crisis, including no new human induced extinctions after 2030. The problem was that the plan was broken down into modules and the sequence of two key aspects were reversed, such that everybody wasted time on the Nature Repair Market (NRM), where private stakeholders would invest in biodiversity credits, similar to the carbon credit scheme.

“If we do it, great, but this remains a tertiary priority for us. Our main priority now is to focus on restoration and integrate climate and biodiversity awareness with sensitive ecological planning, stronger laws, more funding and action on species protection, all supported by stronger public awareness.”

Energy Transitions Must Protect Nature

We must minimise climate change but at the same time we have to be careful about how we do it, says Brendan. For example, Andrew Forrest is clearing about 700 hectares of native forest for windfarms. In the right places, renewables that are low impact could make us net energy exporters in the near future but we need to make sure that everything from windfarms to transmission lines are implemented without further damage to habitats.

“Nuclear is a wasted discussion and we need to get the renewables transition right from the outset,” says

Brendan.

Brendan published a paper in *The Conversation* a few weeks ago in which he said “if humanity’s efforts to mitigate climate change end up damaging nature, we shoot ourselves in the foot. We’re putting wind turbines in rainforests, transmission lines in culturally significant sites.”

Take, for example, the proposed Euston wind farm in southwest New South Wales. It would entail 96 turbines built near the Willandra Lakes World Heritage area, potentially affecting threatened birds. And in North Queensland, the Upper Burdekin wind farm proposal will remove 769 hectares of endangered species habitat relied on by Sharman’s wallabies, koalas and northern greater gliders. The cleared area would be almost 200 times bigger than the Melbourne Cricket Ground.

Map of Queensland. Darker green indicates habitats for a larger number of species. Existing and proposed renewable energy projects are in bright red. Existing transmission infrastructure in blue. [Source](#).

A proposal to build a renewable energy microgrid in Queensland’s Daintree rainforest is another case in point. It is causing pain for local communities, pitting renewable energy advocates against conservation organisations. A major challenge to energy development in Queensland, as in some other parts of Australia, is a lack of transmission infrastructure, or ‘poles and wires’, in the places where renewable energy and nature could most happily coexist.

This infrastructure should urgently be developed in a way that does not impact natural vegetation and species habitats, says Brendan.

“Our mapping for potential wind and solar projects in southern Queensland shows strong potential west of the Great Dividing Range for energy generation without the same level of land-use conflict with natural values and productive agriculture.”

The Future

Brendan says there was much hope when the ALP won leadership but there have been a series of persistent disappointments over unfulfilled promises. Meanwhile, as we head towards election territory in the latter half of 2024, the issue of energy will be central, and the ways in which we manage the energy transition must uphold the principles of the ALP’s nature Positive Plan.

David Shelmerdine, who advises industry on nature positive solutions with Monash University, says we’ve won the war on climate change; the next battle is protecting nature. Brendan goes further.

“To me the main point is that we can’t meet our climate goals without addressing Nature. If we can’t protect Nature, we are lost.”

Brendan says the World Economic Forum now rates biodiversity loss in the top risks to the global economy and there has been a recent shift from preservation of endangered species to threatened species recovery and restoration. This is a major shift in focus.

“We need to restore the systems that support us and achieve the public recognition that other species are needed to sustain our way of life and our economies. We need the political will to implement the laws we already have. Presently, we are failing to enforce the existing rules to protect habitats, let alone provide the funds to do the work.”

What we need now are three things: stronger laws, funding of about \$2 billion per year to prevent any further extinctions, and restoration, which is estimated to cost about \$5-10 billion. For context, this is not a lot of money for such an important issue—it’s far less than the \$35 billion we spend on care for domestic dogs and cats. Or in another context, we raise \$10-13 billion from fuel tax credits.”

Climate is on the agenda for the ALP but not Nature as yet, warns Brendan.

“For climate, we even have the LNP putting up whacky nuclear plans. There is some progress, including the Climate Council, but we’re a long way off for Nature and biodiversity. The big issue is public awareness and motivation to act, and I’d like to see a sharper focus of the Greens on biodiversity.”

“The idea of the Biodiversity Council is that we need an expert voice for biodiversity, one that is evidence-based. Globally we have ACF and WWF but in Australia we didn’t have a base that included social sciences and economists to support action on biodiversity via media and social engagement. The main things we need to get across is why we, as a society, depend on biodiversity, and, secondly, how is it changing. This needs a bottom-up surge of engagement driven by the public upwards to shift the dialogue in media and government.”

“As we head into the next term, we’ll be working on that. So look out. This is a key year for Australia’s ecology and our planetary future.”

Former director of the Threatened Species Recovery Hub (TSRH), Brendan is the founder of the new, national Biodiversity Council set up to protect endangered species. He is also former director of the National Environmental Science Program (NESP), a long-term commitment by the Australian Government to deliver collaborative, practical and applied research to inform decision making and on-ground action on species protection.



The Ghastly Blank, once used to describe outback Australia in the 1800s, was the name given to the swashbuckling palaeo excavations of the National Geographic Society led by Patricia and Tom at Dinosaur Cove and later along the Bass Coast, many places (especially Dinosaur Cove!) of high waters and sheer cliffs once joined to Antarctica to form the supercontinent, Gondwana as well as many expeditions into Central Australia.

EXTINCTION

A Call for Compassion from the Ghastly Blank

WITH PROF PATRICIA VICKERS-RICK

Patricia (Pat) Vickers-Rich has studied the fingerprint of life spanning nearly a billion years; and can authoritatively assert that the crisis in climate and species extinction we confront today is not, as many have asserted in the past, mere natural fluctuations, and today supposedly claimed by many outside the influence of anthropogenic forcings.

She and husband Dr Tom Rich (Curator of Palaeontology at Museums Victoria), both from the US, have led Australia's exploration of its ancient history, studying the biota of Gondwana and collecting more than 70% of the country's Mesozoic mammalian fossils, most from along the Bass Coast near Inverloch, also part of the Ghastly Blank Project.

From her perspective, which spans millennia, one of the biggest issues today is human population.

"Just in the space of my own lifetime," she says, "the world's population has gone from 2.3 billion in 1944 to 8.1 billion in 2024. And the problems of power, inequality, war and planetary destruction have multiplied apace with population. A sensible and compassionate humanity would deal with these issues before bringing more children into the world. As the UN points out, women's education, more equality, and the subsequent fall in birthrates, would

greatly help alleviate the pressure on this planet. Of course, doing so needs careful management to avoid economic collapse, but the ideas of, for example, Elon Musk or Jeff Bezos, who want trillions of people, are beyond insane."

"We are definitely in a major extinction event because of our behaviour, our consumption and human population. Yes, extinction events can be *natural* if it's caused by volcanic eruptions or asteroids but I've gone back 2 billion years and the earlier extinctions like the Cambrian (more than 500 million years ago) and Cretaceous (66 million years ago) and end of the Permian (252 million years ago) were all functionally different from today."

"Today we are witnessing an extinction event on a faster timescale than ever before, and we as humans are having an effect just as devastating as either volcanoes or asteroids in the past. The worst event was the Permian-Triassic Extinction wiping out somewhere around 96% of species due to vast Siberian Traps volcanic eruptions pouring greenhouse gases into the atmosphere, just like today. And another major change in the world's biota changed at the Precambrian-Cambrian transition around 538 million years ago—when a weird world changed into

something more like what we have today as far as the biota."

"We as humans are acting like super volcanoes by re-releasing billions of years of gases from fossil fuels, far over and above the natural carbon cycle and the ability of natural planetary sinks to cope with them. The previous extinctions were pretty dramatic affairs, but so is now."

Pat has worked across borders with scientists in Japan, Russia, the Ukraine, Germany, Iran, Namibia, Timor-Leste, Saudi Arabia and Argentina, etc., all of them beautiful collaborations with good people, with warm invitations to join their national researchers and societies. Having grown up in California, being part Cherokee, Pat grew up in a culture of cooperation rather than control, and looks on the world of war, power and money with increasing dismay.

"I just don't understand why we're at war," she says plaintively.

The human drive to power pushes climate change and inequality, and sadly the effects of climate change itself are likely to accelerate war in the future, not only because of a growing population having to fight over dwindling resources, but also because of the recently established link between periods of high temperatures and civil war tracked by social scientists looking at the past 2000 years.

"Why can't we learn to get along and work cooperatively all around the world? Can we not find ways to work together to try to save this beautiful planet that sustains us and have some respect for each other?"

This is hardly a superficial plea when it comes from Pat. She and husband Tom mortgaged their home to support the Monash Science Centre as well as support students and field work, leveraging their own funds to employ people and build a growing army of more than 700 staff and volunteers, many of whom also put funds into these activities. Under the patronage of her longstanding friend, Sir David Attenborough, the Monash Science Centre was built to inspire and educate children of all ages, to engage them in science education and teach them about planetary health and how they might help sustain it. It was a place where schools and community groups like scouts could come and see and touch everything from dinosaur bones to medical exhibits where kids could try their hand with models of surgery and use their own observations to come to conclusions about things—not just depend on their mobile phones and other authorities without first checking out their reliability.

Attracting millions of visitors from all around the world, it covered exhibitions on geosciences, her

specialty palaeobiology, natural disasters, human medical biology, science and art, astronomy, scientific instrumentation, and climate change and many other topics. It was moved to Swinburne and renamed PrimeSci! in 2012, where it continues its outreach programs to schools and children the world over.

Today's projects with PrimeSci!, other than its continued outreach to schools, includes collaborations with the Science Centre Singapore and many other global institutions, helping to pull together scientifically accurate and exciting exhibitions (such as the present DinoQuest now on in Chengdu China and to travel on to generate research funds and stimulate science education) and building a new sustainability facility. And besides DinoQuest heir work also includes other exhibitions on the polar dinosaurs led by Pat and her husband on display in places like the RACV Resort and the Information Centre near and in Inverloch, Victoria. In their book, the *Dinosaurs of Darkness* (2020), they describe a vast array of previously unknown creatures from Antarctica, Australia, New Zealand, Alaska, and South America who thrived in polar winters where temperatures plunged below freezing.



One among them, for example, was *Koolasuchus cleelandi*, named after the preparator Lesley Kool and the discoverer Mike Cleeland, was a car-sized creature with a head the size of a council rubbish bin that lived along the Victorian coast 125 million years ago, that is until the early Cretaceous period when temperatures rose, and the crocodiles moved in to take over their role as the local apex predator. *Koolasuchus* is now the Victorian state fossil! Another such creature, named after Pat herself by a Russian colleague, was found in ancient Permian rocks of central Russia, uncovering what appears to be the teeth of an early mammal precursor with a skull half a meter long and what appears to be venomous ducts—a huge, poisonous mammal called *Megawhatisia patrichae*.



Perhaps the least likely contender for a poisonous mammal, Pat herself has been described as the 'honorary Mum and grandmother' of countless children and graduate students who blossomed under her tutelage, one being former Greens candidate David Pollock, now 58, another the African lion conservationist Charlotte Read, aged 22. Such is the span of her influence across ages. David says Pat was instrumental in him studying zoology at Monash—'her vast knowledge and passion was infectious and she was hugely respected by students'—and later standing for the Greens in the Northern Territory. Charlotte said the Monash Science Centre was like a 'playground of scientific discovery for kids'.

"I always learned so much when I visited with my brother; every day was something new and it inspired me to pursue a career in STEM," said Charlotte.

Pat says the voice for the Planet must come from educated kids.

Pat grew up on a farm and was no stranger to hard work as a child. Her girlhood days began with milking the farm cow before dawn, picking cotton or grapes after school, and driving tractors from an early age. From this she believes firmly in hard work, education and having a meaningful purpose in life. If a Universal Basic Income were introduced, she believes people should be made to work for it.

Her own heroes? She has pictures of two near her work desk at her home—Nelson Mandela and Derrimut, a tribal elder of the Boonwurrung clan of Melbourne who brokered peace in the 1800s with his friend, then mayor of Melbourne, John Pascoe Fawkner.

"These men were all about peace," says Pat. "Derrimut and Fawkner got together and said 'let's get along instead of fighting each other' and it worked for a little while. As for Nelson Mandela, if he were alive today, I know he would strive to save the planet, and to equitably give people food and shelter. On top of this I would add access to medicine and policies to support community development and cohesion. This could be achieved in a 15 or 20 minute city concept but my preference would also be to embrace nature at the local level. I'm still a country girl at heart and that would be the start of my global utopian heaven."

Whilst working at offices co-located with the Monash Science Centre, the author had the chance to meet Pat's friend, David Attenborough, who asked him of his work on climate change: "Are you optimistic?" A decade later, I had the chance to ask this of Pat.

She replied: "I'm a fighter. And every time I have a chance to talk with people anywhere on the Planet, I keep that fire burning and I try to encourage young people to fight on to save our Planet—not fight wars."

"I just wish we could change the minds of people like Putin and Trump, Netanyahu and those behind Hamas, people who are all about power. It's tragic what is unfolding, sending their and other children to war."

"A sustainable Heaven on Earth, to me, would be no fighting, enough food and shelter for smaller families to build strong communities, preferably among shared farms and native wildlife."

"I like my current neighbourhood among the sheep and the kookaburras. I want children to grow up knowing this sort of environment, knowing their communities, loving nature and using their own observations to make decisions."

Emerita Prof Patricia Vickers-Rich AO is a palaeobiologist and geologist who has studied the changing climate and its effect on biota over the past 600 million years. After a long tenure at Monash where she lectured in palaeontology in what is now the School of Earth, Atmosphere and Environment, she also established the Monash Science Centre, which later moved to Swinburne, now called PrimeScil, where she continues to inspire generations of young zoologists and conservationists.



Burnt Norton

BY CARL GOPALKRISHNAN

About the Contributors



GREGORY ANDREWS

Gregory Andrews is a D'harawal man and a former Ambassador and Threatened Species Commissioner for Australia. From 2-17 November, 2023, he undertook Australia's longest climate hunger strike, solo, on the lawns of Parliament House in Canberra.



DR GINNY BARRETT

An activist of five years in support of Roger Hallam, Ginny has a PhD in public health and serves as a vocal and courageous advocate for animals. She was always conscious of trying to live sustainably but it was hearing Greta Thunberg speaking in 2018 that shifted her life's course. Since then Ginny has supported a host of campaigns with XR and been arrested more than once for civil disobedience.



KASPER BENJAMIN REIMER BJØRKSKOV

Based in Copenhagen, Kasper Benjamin Reimer Bjørk Skov is a vocal climate activist and founder of No Objectives, a non-profit research and design agency turning minority insights into majority actions. Also an architect, Kasper bridges strategy, activism, and design to transform complex challenges into actionable solutions



LISA BLAIR

After discovering sailing when she was 25 years old, a short 7 years later in 2017, Lisa Blair becomes the first woman to sail solo around Antarctica with one stop after surviving a dramatic dismasting at sea, demonstrating her resilience and determination. An extraordinary feat aboard her yacht named Climate Action Now. This symbolic name reflected her commitment to a sustainable future and inspired others to take action through her post-it note campaign. [Her movie Ice Maiden is available now.](#)



PROF ANNALISA BRACCO

World-leading oceanographer, Prof Annalisa Bracco, is Professor and Associate Chair for Research at the School of Earth and Atmospheric sciences at Georgia Institute of Technology in the USA



ROGER CHAO

Writer and poet Roger Chao is in part inspired by the forest and people of the Dandenong Ranges in Victoria where he lives. Roger strives to use his writing to engage audiences about the role they can play in making a difference in all fields of endeavour supporting social justice. His lifelong love of nature and work in community development has also led to mountaineering expeditions and working with the Inuit on the effects of climate change.



LUCY CHAPMAN

A researcher at UTS and former graduate of the University of South Australia, Lucy is researching the intersection of mental health, life expectancy and human wellbeing in the context of global sustainability.



GABRIEL FITZGERALD

Gabriel is a researcher at the University of Technology Sydney working on integrating multiple theories of social cohesion and its relationship to conflict within and between nations as a response to climate change.



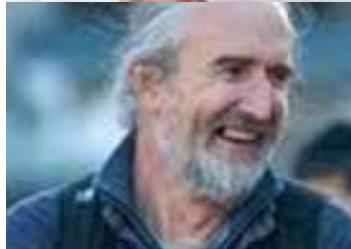
DR JENNIFER GIDLEY

Author, climate educator, psychologist, and futures researcher, Jennifer is a global thought leader and advocate for human-centred futures in an era of hi-tech hype. She was featured in Forbes World's Top 50 Female Futurists list.



CARL GOPALKRISHNAN

Carl Gopalkrishnan is an Australian/UK international visual artist and writer whose art works explore intergenerational trauma, faith and queerness, and creative thinking in international intervention. An Australian of Indian, Chinese and English heritage based in Australia, Carl has also worked in senior policy adviser roles on social cohesion issues for The Ethnic Communities Council of Victoria (ECCV) and the Islamic Council of Victoria (ICV), and as a researcher for State Governments.



DR ROGER HALLAM

Dr. Roger Hallam is a British environmental activist, co-founder of Extinction Rebellion, and a prominent figure in the climate movement known for advocating mass civil disobedience. He has also co-founded Just Stop Oil and Insulate Britain, and was recently sentenced to almost a year's prison for organizing disruptive protests. A former organic farmer and PhD researcher, believes that drastic, truthful action is required to prevent catastrophic climate breakdown.



DR SARAH HOWE

Recently stepped down as Fabians national chair, Dr Sarah Howe is a leading expert on European public policy, political economy, industrial policy, economic development, competitiveness, regional development, and place based development. She works closely with Dr Read as cofounder of the Future Emergency Resilience Network focused on the socioeconomic impacts of climate change, species extinction and nine other existential threats.



SUZI KARADIMAS

An expert in criminology, Suzi is working at the University of Technology Sydney to assess the climate change implications of crime rates across nations—a field undeveloped within the SDGs and Doughnut Economics.

**PROF DAVID KAROLY**

Joint winner of the 2007 Nobel Peace Prize and Australia's leading climatologist, Federation Prof David Karoly, gained his PhD in meteorology at the UK's University of Reading. Returning to Australia, he became Director of the Monash Cooperative Research Centre for Southern Hemisphere Meteorology and later Leader of the Earth Systems and Climate Change hub for the Australian government and was a lead author for the IPCC Working Group 2 on the social impacts of climate change.

**TYLER KRAIN**

Tyler is a researcher at University of Technology Sydney where he is focused on the economics of equity and its role in health and sustainability. His expertise resides in quantitative research methods.

**MELISSA MCLAY**

Campaign manager, fundraiser and events organiser, Melissa McLay has a thirty-year commitment to activism in support of animal welfare and unionism fighting against capitalistic extraction in mining, petrochemicals and pharmaceuticals. Supporting conservation-based charities like the Coalition Against Duck Shooting and Fly by Night Bat Clinic, she has stood waist-deep in swamplands with bullets raining down on all sides; led and participated in civil disobedience against companies like Monsanto; and stood shoulder to shoulder with unionists fighting for better wages and conditions.

**DARCY MULLINS**

Darcy is passionate about the intersecting dynamics between wellbeing, social justice, climate change and their influence within contemporary society. She is a researcher at the University of Technology Sydney.

**SAIMA RAHIMI**

Saima is working at the University of Technology Sydney to assess food security in the face of climate change. She has a particular focus on food systems within Kate Raworth's framework for Doughnut Economics.

**CHARLOTTE READ**

Charlotte Read is an Australian wildlife conservationist and photojournalist focused on human-wildlife conflict mitigation across three continents. She has worked with WWF on tigers, lions in Zimbabwe and kangaroo management in Australia. Founder of Art for Our Earth she regularly posts on conservation ethics and creativity on Instagram and other media. She is also a global representative coordinator of Women in Wildlife across 28 nations.



HAMISH READ

Hamish Read served as Assistant Editor of the Australian Fabians Review and worked behind the scenes to pull together work with the ACTU, Search Foundation, Australia Institute, Victorian Trades Hall Council, and United Workers Union. This was preparatory work for the development of a union-led Productivity Taskforce focused on equality, economic democracy and sustainable development in advance of the Economic Reform Roundtable led by Treasurer, The Hon Dr Jim Chalmers for the federal government.



CAPT PAUL WATSON

Canadian-American champion of ocean conservation, Captain Paul Watson is the founder of Sea Shepherd Conservation Society, 1977, and the Captain Paul Watson Foundation, 2022, as well as the Church of Biocentrism. An outspoken critic of capitalism, Captain Watson promotes veganism, population reduction, and a biocentric, rather than anthropocentric, worldview. He is the author of *Urgent! Save our Oceans to Survive Climate Change*.



PROF PAUL READ

Associate Prof Paul Read, a sustainability researcher at Charles Sturt University, completed his PhD entitled *Human Needs, Equity and Wellbeing in the Context of Global Sustainability* whilst working on the Sustainable Development Goals with the United Nations and forensic work on natural disasters and bushfires with Australian firefighting agencies and police. He has worked with WHO, Harvard and Oxfam on social determinants of public health to build socioeconomic structures aimed at human flourishing within planetary boundaries.



PROF PATRICIA VICKERS-RICH AO

Prof 'Pat' is a palaeobiologist and geologist who has studied avian species and the ancient ediacarans over the past 600 million years. Her awards span a Who's Who of prestigious prizes for books and research—the Eureka Prize, Whitley Medal and National Geographic, among many others and most recently elected as a Foreign Member of the Russian Academy of Science due to her research and exhibition involvement with the Paleontological Institute in Moscow (remember The Great Russian Dinosaurs Exhibition in Australia during 1993-1994/).



DR TONY WEBB

A long-time community and environmental activist, Tony has an MSc in Energy Resources Management and a PhD in Humanities exploring how strong emotions aid or hinder personal and political change. A former ALP candidate in the 2018 SA election he now lives in Melbourne working on a joint Fabian/LEAN food industry security/sustainability project and development of men's emotional health and wellbeing groups through the Men's Sheds network.



PROF BRENDAN WINTLE

Former director of the Threatened Species Recovery Hub (TSRH), a partnership of 250 experts across six years that ended in 2021, Brendan is the founder of the new, national Biodiversity Council set up to protect endangered species. He is also former director of the National Environmental Science Program (NESP), a long-term commitment by the Australian Government to deliver collaborative, practical and applied research to inform decision making and on-ground action on species protection.

REMOVED IT NEARER TO THE HEARTS DESIRE



The Fabian Window

The Fabian Window is a stained-glass window depicting the founders of the Fabian Society, designed by George Bernard Shaw. The window was stolen from Beatrice Webb House in Dorking in 1978 and reappeared at Sotheby's in 2005. It was restored to display in the Shaw Library at the London School of Economics (LSE) in 2006 at a ceremony presided over by then-Prime Minister Tony Blair, emphasising New Labour's intellectual debt to the Fabians.

The stained glass window was designed by George Bernard Shaw in 1910 as a commemoration of the Fabian Society. Artist Caroline Townshend (cousin of Shaw's wife Charlotte Payne-Townshend and daughter of Fabian and Suffragette Emily Townshend) created the window according to Shaw's design. Sue Donnelly of the London School of Economics describes the window as:

In the style of a Tudor family memorial. At the top Sidney Webb and Shaw himself are shown hammering out a new world on an anvil beneath an emblem of a wolf in sheep's clothing reflecting the Society's gradualist approach. On their left the secretary of the Fabian Society, Edward Pease is working the bellows and below are the smaller figures of active members of the Fabian Society.

These included Emily Townsend, H. G. Wells, Annie Besant, Hubert Bland, E. Nesbit, Sydney Olivier, Oliver Lodge, Leonard Woolf, Emmeline Pankhurst and Mrs Boyd Dawson.



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