CLIMATE CHANGE, SCIENCE AND COUNTRY

Brendan Mackey

IT WOULD BE hard to hear a louder warning bell than the 2018 special report from the Intergovernmental Panel on Climate Change (IPCC) on the impacts of global warming of 1.5 degrees above pre-industrial levels. The report delivers the stark message that global warming is likely to reach 1.5 degrees by around 2030 if emissions continue at their current rate, and that emissions will have to reach zero by around 2050 if we are to avoid passing this tipping point. While warning that we are already facing climatic disruptions and flow-on effects such as sea-level rise, exceeding the 1.5 degree threshold will result in significantly greater impacts – some of which may be irreversible. This is because climate-related risks for natural and human systems are much higher if global warming exceeds 1.5 degrees. The catalogue of risks includes a greater loss of species and ecosystems, including tropical coral reefs, amplification of extreme weather events (heatwaves, floods and droughts), accelerated sea-level rise and a sea-ice-free Arctic Ocean in summer. Limiting global warming to 1.5 degrees, compared with 2 degrees, could reduce the number of people exposed to climate-related risks and susceptible to poverty by 2050 by up to several hundred million.

While more IPPC reports are scheduled in the coming years, including the Sixth Assessment Report in 2022, it is this special report that delivers the science story of our time, a starker-than-usual narrative that will frame the rest of our lives and those of our children. We are at grave risk of crossing planetary tipping points and a destabilisation of the climate, leading to a 'Hothouse Earth' pathway, resulting in a 'never-ending story' of global climatic disruption where there is no 'normal' climate, no period where climatic conditions are sufficiently stable to be relied upon. The new norm will be, put simply, no-norm, and a planetary climate will emerge that undermines the viability of the human project as it is currently configured, threatening the safety, livelihoods and identity of people, and the continued existence of many species and ecosystems. This is a story that we – and particularly those of us in economically developed countries such as Australia – have all helped co-create. Reflecting on this new physical reality elicits existential crises of various kinds – including a literal crisis of existence for many.

IT IS WITH some reluctance that I draw readers' attention to such cataclysmic conclusions about the future of Earth's environmental conditions and the implications for the wellbeing of humans and nature. Scientists do not make for good catastrophists, as the scientific method does not favour a mind that is predisposed to speculative hyperbole. Rather, scientific knowledge is founded on quantifying and bounding the uncertainties associated with measurements, correlations and simulations, and the appreciation that any one research study samples a limited data domain, is true only within specified limits, and is but one piece of a larger puzzle. Such is their rectitude, scientists refer to modelled estimates of future climatic conditions as 'projections' rather than 'predictions'. Given this, a scientist's preference will be to eschew attempts at exploring the foreign territory of 'narrative' and limit their own literary outpourings to the more prosaic task of writing 'lab reports'.

However, such is the gravitas of the climate change problem and its consequences for the future and survival of humanity, and the general failure of the science story as told so far to grip as it should, that it is perhaps not surprising for scientists – myself included – to be increasingly interested in what other disciplines have to say about climate change and the Anthropocene and the stories that they tell.

After all, humans are storytellers and narratives are how we make sense of the world and our place in it. Climate change may be a scientific discovery, but it is the humanities and creative arts that speak to what this means. It is not just lab reports but stories, works of artistic expression and the interpretation of human–environment interactions through the lens of social and cultural theories that can provide the necessary insights and understandings into how people can be engaged about our planetary ecological crisis. Also critical to the construction of climate narratives are the voices from the frontlines – the civil society activists who are individually and collectively making a stand for climate justice in the face of a lethargic legal system and societal climate responses that fail to fix the problem faster than we cause it.

To this end, I was involved in organising the Narratives of Climate Change Symposium held last July at the University of Newcastle. The symposium was an interdisciplinary collaboration, being the brainchild of Nicole Rogers from the Southern Cross University School of Law and Justice, and consummately chaired by Elena Aydos of Newcastle Law School. It was inspired by the possibility that the 'gap between scientific knowledge and effective political, legal and social action can be bridged by alternative forms of narrative'. Researchers from the sciences and humanities, academic and practicising scholars, along with activists, gathered to share their stories, experiences and insights. Scientists were also present, valued as reliable narrators in a world currently infected with outbreaks of false claims and fake news.

In a world at risk from a 'Hothouse Earth' trajectory, the delegates agreed that 'activism' cannot be regarded as a dirty word. Among the most engaging of the activists present were the Knitting Nannas, who draw on a broad history of knitting used as a tool for non-violent political activism and view their knitting skills as less important than the act of bearing witness while they knit. Established in 2012, the Knitting Nannas Against Gas are 'annoying all pollies equally' and 'want to know what their policies are that affect climate change, pollution, mining subsidies and mining company donations and so on and so forth'. They also look to recruit beyond those with knitting needles, arguing that 'you don't have to knit to save the land, air and water for the kiddies'.

AUSTRALIA IS AS exposed as anywhere else to current and future climate hazards – and more so than many other landscapes given the tenuous and erratic nature of climatic conditions that already exist over most of this continent. But if ever there was a political football, climate change science is possibly the bounciest of them all in our short modern political history. Five prime ministers have now scored own goals, or at least tripped on the shoelaces the climate change debate has left dangling.

Yet climate change science has long been front and centre of public debate in Australia with advocates for climate action keen to translate the science into more popular and policy-relevant renderings. There is no shortage of scientifically based information about current and future impacts to humans and nature in Australia from climate change. State governments in New South Wales, Queensland and South Australia, along with many local governments, have substantial climate change strategies and plans already being implemented. Hundreds of millions of dollars are being spent on actions aimed at reducing the vulnerability of the Great Barrier Reef to climate-change impacts. But the national mitigation policy needed to attack the root cause of the problem – carbon dioxide and other greenhouse gas emissions from burning fossil fuel for energy and from deforestation and degradation – remains lacking in any substantive measure.

As one of the most urbanised nations on Earth, many Australians have only scant familiarity with the 'outback' and regional Australia, and are largely ignorant about the true state of the land and the problems that beset it. Nonetheless, climate impacts are an everyday reality for even the most urbanised Australians through droughts, fires, floods, storm surges and the extensive media reporting on events such as large-scale coral bleaching on the Great Barrier Reef, all of which are being amplified in one way or other by human-forced climate change.

But Australia is also home to First Nations people for whom living with a changing climate is nothing new. Perhaps modern Australia can learn some lessons about adaptation from its Indigenous peoples and the stories they have to tell.

Genetic analysis has revealed that the ancestors of Aboriginal Australians arrived on the ancient landmass of Sahul (present-day New Guinea and Australia) around 55,000 years ago, and that their culture and traditional lands have coexisted *in situ* for all that time. Through the last 55,000 years of climate change, following the end of the last glacial maximum around 20,000 years ago, Aboriginal Australians not only survived but flourished. Leaving aside the debate around the role of humans in the collapse of certain megafauna species, and with the exception of the introduced dingo, the plant and animal species that inhabited this continent when Captain Cook reached Botany Bay in 1770 had persisted for millions of years. Aboriginal Australians not only thrived, they did so in a way that both accommodated climate change (including increasing aridity and variability) and enabled coexistence with a bewilderingly rich biodiversity.

Reflecting on this successful navigation of past climate change is of more than historic interest. Its relevance to our current situation becomes more evident when we understand that the climate crisis we face is a 'post-normal' problem; that is, a problem not necessarily amenable to the strict application of normal science. In post-normal problems, the level of uncertainty is high, subjective values are central to the problem and in dispute, the social stakes are high, impacts are potentially irreversible, and there is more than one plausible answer or multiple possible resolutions. Post-normal science addresses limitations in the normal scientific method by drawing upon the experience of practitioners and the relevant communities. In this way, holders of traditional knowledge can be understood as members of an 'extended peer community' with complementary knowledge and experiences. Post-normal science provides a suitable platform for addressing climate problems as it recognises that an extended peer community is better able to engage in ethical judgements and make sense of the results and conclusions derived from the quantitative reductionisms of normal science.

PROBLEMS OF SUSTAINABLE development, including that of climate change, are typically treated in a reductionist manner and addressed through instrumental solutions, reflecting a Cartesian dualistic world view that holds humans as standing 'outside' of nature. While human-forced climate change is certainly a real-world problem, could it be that the lack of urgency among the general public and the timidity of our political responses is in part because we are stymied by a narrow-minded and blinkered way of thinking about human–nature relations? The traditional knowledge of Aboriginal and Torres Straight Island communities presents a different world view, one that does not divide the world into the binary states of human and non-human, or even living and non-living.

Rather, there is considered to be continuity between humans, other life forms, and physical entities. And people have obligations to care for country – their ancestral lands – that transcend any individual and short-term self-interest. Extending such an ethic to our relationship with Earth in a global sense may help people recalibrate the significance they ascribe to threats from a rapidly changing climate in terms of both the current and future wellbeing of people and the ecological integrity of the planet.

My own research in this area has included collaboration with David Claudie, a Kuuku I'yu Northern Kaanju traditional owner and CEO-chairman of Chuulangun Aboriginal Corporation on the east coast of Cape York Peninsula in northern Australia. The We Kuuku I'yu Northern Kaanju or Kaanichi Pama 'inland' people belong to the highlands – the mountains, tablelands and sand ridge country of central Cape York Peninsula. I met David through our respective membership of two advisory committees that were established under state law to provide scientific, social and cultural advice to the Queensland Government about areas of potential World Heritage significance on the cape. Our collaboration arose from the many interactions that occurred over the course of years through our committee work, as well as subsequent discussions about how traditional knowledge and scientific knowledge can and should work together to address the challenges David's people face. Through David I've been privileged – and surprised – to learn that Kuuku I'yu Northern Kaanju traditional knowledge includes the oral histories of Indigenous people's experiences of European contact and forced removals, the importance of how knowledge itself is managed, and the ways in which their cosmology and sacred knowledge, and the relations between people and tracts of land, beliefs and taboos, inform an holistic ethical system.

Despite surveys demonstrating that an overwhelming majority of Australians accept the reality of climate change and the scientific explanation of its cause, this fact has yet to translate into sufficiently strong political support for the kinds of transformative policies needed. Perhaps most people do not think the problem is sufficiently urgent. Perhaps they're distracted by more mundane domestic matters or by the other big issues of our time: weapons of mass destruction; a human population of 7.5 billion, 2.1 billion of whom live on less than $3.10 per day; and the biodiversity extinction crisis. Or perhaps they simply do not accept any moral responsibility for the problem.

The climate change story as told by science brings more uncertainty and trepidation than hope and inspiration. But that uncertainty is at least bounded by the fact that we can scientifically project into the future, establishing some idea of the likelihood of potential impacts. And we are right to feel trepidation given the political reality of inadequate action on mitigating greenhouse gas emissions.

Human-forced climate change casts a long, dark shadow over all human affairs. It is the never-ending story our children will be narrating to their children and those that follow – no matter where they live.

References

Archer, D et al. 2009, Atmospheric Lifetime of Fossil Fuel Carbon Dioxide, *Annu. Rev. Earth Planet. Sci.*, vol. 37, pp. 113–34, doi:10.1146/annurev.earth.031208.100206.

Bulletin of the Atomic Scientists 2018, *Nuclear Notebook*, viewed 10 September 2018, https://thebulletin.org/nuclear-notebook/

Carrington, D 2018, 'UN environment chief criticised by UN over frequent flying', *The Guardian*, Friday 21 September, viewed 30 September 2018, https://www.theguardian.com/environment/2018/sep/21/un-environment-chief-criticised-by-un-over-frequent-flying-eric-solheim

Ceballos, G, Ehrlich, PR & Dirzo, R 2017, Biological annihilation via the ongoing sixth mass extinction signaled by vertebrate population losses and declines. *PNAS* vol. 114, no. 30, E6089-E6096; https://doi.org/10.1073/pnas.1704949114

Dewey, John 1930, *The Quest For Certainty*, George Allen and Unwin Limited.
ECI (2018) *The Earth Charter*. Earth Charter Initiative, viewed 30 September 2018, http://earthcharter.org/discover/the-earth-charter/

IPCC (2018) *Global Warming of 1.5 ºC: an IPCC special report on the impacts of global warming of 1.5 ºC above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty. Summary for Policy Makers*. Intergovernmental Panel on Climate Change.

Gensler, HJ 1985, Ethical consistency principles, *The Philosophical Quarterly*, vol. 35, no. 139, pp. 156-170.

Johnson L.B. (1965) *Statement by the President in response to Science Advisory Committee Report on Pollution of Air, Soil and Waters. November 6 1965*. The American Presidency Project, viewed 30 September 2018, http://www.presidency.ucsb.edu/ws/?pid=27355

Klaver, I 2013, 'Environment Imagination Situation', in R. Rozzi, STA Pickett and C Palmer (eds.), *Linking Ecology and Ethics for a Changing World: Values, Philosophy, and Action* (Dordracht: Springer, 2013), pp. 85–105.

KNAG (2018) Knitting Nannas Against Gas, https://knitting-nannas.com/news.php?id=42

Leviston, Z, Greenhill, M & Walker, I 2015, *Australians attitudes to climate change and adaptation: 2010-2014* CSIRO, Australia.

Lüthi, D et al. 2008, High-resolution carbon dioxide concentration record 650,000-800,000 years before present, *Nature*, vol. 453, pp. 379-382.

Mackey, B, Watson, JEM & Hope, G 2008, Climate change, biodiversity conservation, and the role of protected areas: an Australian perspective, *Biodiversity* vol. 9, pp. 11-18.

Mackey B. & Claudie, D 2015, Points of contact: integrating traditional and scientific knowledge for biocultural conservation, *Environmental Ethics* vol. 37, no. 3, pp. 341-357;VDOI:10.5840/enviroethics201537332.

References

Pope Francis 2015, *Encyclical Letter Laudato Si' of the Holy Father Francis on Care for our Common Home*, The Vatican, Rome, viewed 30 September http://w2.vatican.va/content/francesco/en/encyclicals/documents/papa-francesco_20150524_enciclica-laudato-si.html

Reser, JP, Pidgeon, N, Spence, A, Bradley, G, Glendon, AI & Ellul, M 2011, *Public risk perceptions, understandings*, and responses to climate change *in Australian and Great Britain*: *Interim Report*, Griffith University, Brisbane, viewed 30 September 2018 www.nccarf.edu.au/public_risk_perceptions

Rogers, N 2016, 'Litigation, activism, and the paradox of lawfulness in an age of climate change', in Tom Bristow and Thomas H Ford (eds.), *A cultural history of climate change*, Routledge, pp. 211 – 228.

Steffen, W, Crutzen, PJ & McNeill, JR 2007, The Anthropocene: Are Humans Now Overwhelming the Great Forces of Nature, *AMBIO*: *A Journal of the Human Environment*, vol. 36, no. 8, pp.614–621.
Steffen, W.et al. 2018, Trajectories of the Earth System in the Anthropocene, *PNAS* vol. 115, no**.** 33, pp.8252–8259, viewed 30 September 2018 http://www.pnas.org/lookup/doi/10.1073/pnas.1810141115

Walker, M et al. 2009, Formal definition and dating of the GSSP (Global Stratotype Section and Point) for the base of the Holocene using the Greenland NGRIP ice core, and selected auxiliary records, *J. Quaternary Sci*., vol. 24, pp. 3–17.

World Bank (2016) *Poverty and Shared Prosperity 2016*: *Taking on Inequality*. World Bank, Washington, DC, doi:10.1596/978-1-4648-0958-3.

This work originally appeared in 2019 in *Griffith Review 63: Writing the Country* (published in partnership with The Nature Conservancy and McLean Foundation). It is reproduced on the Climate Justice Observatory with permission of the author and thanks to Griffith Review.

Professor Brendan Mackey is Director of the Griffith Climate Action Beacon, Griffith Climate Change Response Program, and the National Climate Change Adaptation Research Facility at Griffith University.

climate justice observatory

GRIFFITH UNIVERSITY