

Changing how we view change: the artist's insight

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Abstract

Environmental law is failing in regulating environmental change. The state of the environment is getting worse. There are many reasons for this failure. One is the law's resistance to change. Another is that environmental law preferences cognitive knowledges, such as scientific and technological knowledges, over perceptual and aesthetic knowledges. Addressing the environmental crises demands all these knowledges. One way to reform environmental law is to seek out perceptual and aesthetic knowledges. Artists are one source of such knowledges: they perceive the environment and environmental problems in different ways.

I will examine how artists address five aspects of environmental change: contingency, chronology, causes, consequences and complexity of change. These aspects of change are at the core of environmental law. Current law and practice deals poorly with these aspects of change. Can artists offer insights that current law and practice do not? I will use artworks of renowned Australian artists to illustrate their insights.

Constancy of change

The reason for and purpose of environmental law is to regulate environmental change. The environment is changed by humans' exploitation of its natural resources. Resource laws regulate which, where and how natural and mineral resources can be exploited. The environment is changed by humans' development of it. Planning laws regulate which, where and how development may be carried out. The environment is changed by humans' pollution of it. Pollution laws regulate which, where and how pollution can occur. And laws regulate how to repair the environment changed by humans' exploitation, development and pollution of it.

It is ironic, therefore, that environmental law regulates change so poorly. Notwithstanding over five decades of modern environmental law,² on almost every indicator, the state of the environment is declining, in many areas quite dramatically. Natural resources have been exploited unsustainably, leading to the collapse of some

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² Much environmental law dates from and was inspired by the United Nations Conference on the Human Environment held in Stockholm in 1972.

biological resources (such as fish) in certain areas.³ Vast areas of land and sea have been developed. Only 17% of the Earth's lands and seas have been conserved, well short of renowned biologist, EO Wilson's call for half of the lands and seas to be protected to reverse biodiversity loss and ensure the long term health of the planet.⁴ Pollution of the land, air and water has grown exponentially, so that there is now no place on Earth not polluted by some substance or some thing.⁵ The climate crisis is an existential pollution problem.

There are many reasons for the failure of environmental law to manage change. One central reason is that law values stability, consistency and predictability and is therefore resistant to change. Most areas of law are stable and change only incrementally and slowly. Not so environmental law. Environmental law deals with environmental problems that are complex, polycentric and ever-evolving, what Liz Fisher describes as "hot situations". If it is to regulate effectively these hot situations, environmental law must also evolve, shifting its shape and structure to adapt to the changing environment. It must become "hot law".⁶

The constancy of change is confronting. Lawmakers and law enforcers find comfort in the past, which is known, tried and tested. But that is to ignore the present and the future, which are yet to be known, tried and tested. And it is to set their faces against the winds of change. As Bob Dylan sang in "The Times They are A-Changing":

"Come senators, congressmen
Please heed the call
Don't stand in the doorway
Don't block up the hall
For he that gets hurt
Will be he who has stalled
The battle outside ragin'
Will soon shake your windows
And rattle your walls
For the times they are a-changin'."

Here is the challenge: constancy of change cannot be addressed by constancy of law. Rather, constant change must be addressed by constantly changing law.

Different ways of viewing change

³ Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, *Nature's Dangerous Decline 'Unprecedented' Species Extinction Rates 'Accelerating'* (Report, 2019).

⁴ EO Wilson, *Half-Earth: Our Planet's Fight for Life* (Liveright, 2017).

⁵ In 2019, 99% of the world population was living in places where the WHO air quality guidelines levels were not met, World Health Organisation, *Ambient (outdoor) air pollution* (Factsheet, 22 September 2021); see Rachel Nuwer, 'There's no such thing as truly 'pristine' nature anymore' *BBC* (online, 8 February 2016) <<https://www.bbc.com/future/article/20160208-theres-no-such-thing-as-truly-pristine-nature-anymore>> and 'Levels of 'forever chemicals' reaching Antarctica have been increasing' in Jack Garnett et al, 'Increasing Accumulation of Perfluorocarboxylate Contaminants Revealed in an Antarctic Firn Core (1958–2017)' (2022) *Environmental Science & Technology*.

⁶ Elizabeth Fisher, 'Environmental Law as "Hot" Law' (2013) 25 *Journal of Environmental Law* 347, 349-351.

How should we change the law? Albert Einstein is attributed with defining insanity as doing the same thing over and over again and expecting a different result. With environmental law, we keep using the same legal techniques and approaches, and using the same knowledges, to address ever-changing environmental problems. It is unsurprising, therefore, that we keep getting the same result, failing to address the environmental problems. This suggests we need to change our approach to environmental law; we need to do things differently.

One thing we could do differently is expand the knowledge base upon which we act. Environmental law is founded on knowledge singularism rather than knowledge pluralism. Environmental law preferences cognitive knowledges over perceptual and aesthetic knowledges. Cognitive knowledge is based on empirical factual knowledge. In environmental law, it is based on expert knowledges, particularly scientific and technical knowledges. Perceptual and aesthetic knowledges are based on sensual perception, aesthetic experience and sensitivity to place.

This preferencing of cognitive knowledges is exemplified by a linchpin of environmental law, environmental impact assessment (EIA). EIA is the official appraisal of the likely impacts of a policy, program or project on the environment. The description of the environment to be impacted, and hence the environmental impacts, is skewed to the scientific and technical, away from the perceptual and aesthetic.

This approach reflects logical positivism in philosophy, such as propounded by AJ Ayer,⁷ and legal positivism, such as propounded by John Austin⁸ and HLA Hart.⁹ Ayer's logical positivism proposed that statements about the world are meaningful only if they can be confirmed or disconfirmed by our sensory experience of the external world. For Ayer, there are two types of cognitively meaningful statements. The first type are statements that are empirically verifiable, such as scientific statements and statements of ordinary fact. The second type are statements that are analytic, such as statements of mathematics or logic. Statements that are not empirically verifiable are meaningless.¹⁰ Logical positivism appeals to people who perceive that reality is a world of facts described by the natural sciences.¹¹ Environmental law and EIA embrace this world view.

Legal positivism corroborates this approach. Law is set by some legal authority that is recognised by society; law is an expression of power. These laws are "positive" laws because they are posited or set by institutions or people with law-making power.¹² Law

⁷ A J Ayer, *Language, Truth and Logic* (Penguin Books, 1936).

⁸ John Austin, *Province of Jurisprudence Determined* (Cambridge University Press, 1832).

⁹ See in particular, HLA Hart, *The Concept of Law* (Oxford University Press, 2nd ed, 1994).

¹⁰ OUP Philosophy, "A J Ayer and Legal Positivism" (online, 1 May 2020) <<https://blog.oup.com/2020/05/a-j-ayer-and-logical-positivism/>>.

¹¹ Thomas Nagel, 'What is rude?' *London Review of Books* 44(3), 10 February 2022, 3, 5.

¹² Roger Cotterrell, *The Politics of Jurisprudence: A Critical Introduction to Legal Philosophy* (Butterworths, 1989) 58.

is also to be separated from morality.¹³ On a legal positivist approach, environmental law is confined to that which is posited by such lawmakers. As conventionally drafted, environmental laws require decision-makers to identify, assess and consider the impacts of a proposal having regard to the world of facts described by the natural sciences. The sciences filter out ways of knowing and describing the world other than through the sciences.¹⁴

Both logical and legal positivism are based on empiricism. The reality of the world and the law that deals with it are to be understood in terms of observable occurrences.¹⁵ There is a preoccupation with empirical proof by facts, particularly scientific facts, and a distrust of intuition or morality.

The reliance of the law, and environmental law in particular, on positivism and empiricism is necessary but insufficient. Necessary because an abiding characteristic of the law and legal decision-making is rationality.¹⁶ Their persuasive force rests on logic and reason. This is important for environmental decision-making. We want decisions that impact the environment to be evidenced-based and rational.¹⁷ The climate crisis will be solved by administration that respects, not ignores, climate science.

Nevertheless, whilst reliance on cognitive knowledges is necessary, it is insufficient. Changing how environmental law and governance manages environmental change involves promoting knowledge pluralism. It involves seeking out people with different ways of knowing the world and listening to their voices. It involves learning from these different knowledges, from not just the expert but the aesthete, not just the epistemic community but the local community, not just the lawyer but the layperson, not just Western knowledges, but indigenous knowledges. There still will be recourse to and reliance on the experts' empirical data, but there will be an expansion of the ways of sensing and experiencing the world beyond that data.

One of the different voices that can beneficially be heard is that of the artist. Artists sense and experience the world differently to scientists or technicians and they communicate their sensory experience in different ways to how scientists or technicians communicate. Aristotle identified three ways to persuade: *logos* (appealing to logic or reason), *pathos* (appealing to emotions) and *ethos* (appealing to ethics or morals).¹⁸ Scientists and technicians employ the first way; artists employ the second and third ways. Scientists' and technicians' cognitive knowledges often employ empirical data, supporting environmental decision-making based on logic and reason. That is essential in a world increasingly seduced by right-wing populism.¹⁹ But we also

¹³ *ibid*, 57; Brian Bix, *Jurisprudence: Theory and Context* (Sweet & Maxwell, 5th ed, 2009) 33-36.

¹⁴ Ronald W Hepburn, 'Landscape and Metaphysical Imagination' (1996) 5 *Environmental Values* 191, 194.

¹⁵ Cotterrell (n 12) 85.

¹⁶ Lon L Fuller, 'The Forms and Limits of Adjudication' (1978) 92 *Harvard Law Review* 353, 364-7.

¹⁷ Brian J Preston, 'The End of Environmental Law?' (2019) 31(3) *Journal of Environmental Law* 399, 410-411.

¹⁸ Aristotle, *Rhetoric: Book I*, chapter 2.

¹⁹ Preston (n 17).

need to employ perceptual and aesthetic knowledges in environmental decision-making. Artists bring perceptual and aesthetic ways of knowing the world and communicating that knowledge to environmental decision-makers. These knowledges enhance and enrich environmental decision-making.

Ben Richardson, in his book *The Art of Environmental Law: Governing with Aesthetics*, shows “how insights from aesthetics can enrich the study and understanding of environmental law. Aesthetics, be they relating to pictorial, musical or other art forms, can provides insights into environmental law that conventional modes of inquiry have relegated to the periphery.”²⁰

By providing different insights into environmental problems, art can be a stimulus for taking action, or taking different action, to address environmental problems. Art can appeal to emotions and ethics, it can move the heart and not just the mind. Think of two powerful sets of images that have changed our views of the world.

First, two iconic photographs of Earth, “Earthrise” taken in 1968 by the Apollo 8 crew and “Blue Marble” taken in 1972 by the Apollo 17 crew, transformed how we view our planet. These are some of the most widely distributed photographic images in existence. They showed the fragility, the isolation and the limits of the planet in ways never previously appreciated. They promoted the world view of “Spaceship Earth”. Kenneth Boulding in his classic essay “The Economics of the Coming Spaceship Earth”²¹, called for a transformation of the world’s economies from an open economy of apparently illimitable resources, his “cowboy economy”, to a closed economy, his “spaceman economy”, in which “the earth has become a single spaceship, without unlimited reservoirs of anything, either for extraction or for pollution, and in which, therefore, man must find his place in a cyclical ecological system”. Buckminster Fuller similarly invoked the concept in his book, *Operating Manual for Spaceship Earth*.²²

The second image that has changed a world view is Olegas Truchanas’ photograph, “Morning mist, Rock Island Bend” of the Franklin River, Tasmania. That image was the defining symbol in the successful campaign to prevent damming of the Franklin River for hydro-electric development. It was used as a full page advertisement in major Australian newspapers in the leadup to the 1983 Australian federal election with the caption “Could you vote for a party that would destroy this?” The Australian voting public answered that they could not and voted in a new government. The Franklin River was later preserved as a part of the Tasmanian Wilderness World Heritage Area.²³

²⁰ Benjamin J Richardson, *The Art of Environmental Law: Governing with Aesthetics* (Hart, 2019) 5.

²¹ Kenneth E Boulding, “The Economics of the Coming Spaceship Earth” in H. Jarrett (ed) *Environmental Quality in a Growing Economy* (Johns Hopkins University Press, 1966) 3-14.

²² R Buckminster Fuller, *Operating Manual for Spaceship Earth* (E P Dutton & Co, 1969).

²³ Alice Hungerford, *UpRiver: untold stories of the Franklin River activists* (UpRiver Mob, 2013), see also Brian J Preston, “The Australian Experience on Environmental Law” (2018) 35 *Environmental and Planning Law Journal* 637 at 647-648 for a summary of the legislative and judicial responses.

I will illustrate how artists can bring different ways of knowing the world by examining how artists view five aspects of environmental change: contingency of change, chronology of change, causes of change, consequences of change and complexity of change. These aspects of environmental change are at the core of environmental law and governance. I will commence my examination of each aspect of environmental change with an analysis of the difficulties that the aspect presents for environmental law and governance. I will then select artworks of Australian artists to illustrate how they perceive and communicate these aspects of environmental change.

Contingency of change

Environmental law focuses on the environment as it is today, and how it will be in the future if the proposed exploitation, development or pollution were to be permitted. These are two snapshots in time, the environment today and the environment tomorrow. EIA is illustrative of this snapshot approach. Environmental law and EIA rarely focus on the processes that shape the environment, just the resultant shape.

There is an assumption here, that the environment is at equilibrium in space and time. That assumption underpins much of existing theory and methods in ecology.²⁴ Yet, any environment, although seemingly in stasis in any snapshot in space and time, is always changing. The forces of change are both within and without the environment. There are non-equilibrium processes within the natural environment, even within ecological communities.²⁵ There are anthropological processes at work, outside the natural environment, effecting large-scale human modification of ecological systems. The challenges the Anthropocene poses for ecological systems particularly and the environment generally demand that environmental law and governance pay attention to non-equilibrium processes, both natural and anthropogenic.²⁶

Environmental law and governance, therefore, needs to change its focus and approach, from looking not merely at the state of the environment as manifested at any place and time, but also at the processes that have changed, are changing or will change the environment in space and time. Environmental law and governance should assume and plan for the inevitable contingency that the environment will change. In short, environmental law and governance needs to adopt not only a contingency approach, assuming that the environment will change over space and time and develop change strategies accordingly, but also a contingency model of change, so as to vary the change strategies in accordance with the environmental changes.²⁷

²⁴ Giovanni Rapacciuolo, Andrew J Rominger, Naia Morueta-Holme and Jessica L Blois (2019) 'Editorial: Ecological Non-equilibrium in the Anthropocene' 7:428 *Frontiers in Ecology and Evolution* 1.

²⁵ *ibid.*

²⁶ *ibid.*, 2.

²⁷ In a business management context, Dunphy and Stace have proposed a contingency model of change management: Dexter Dunphy and Doug Stace, 'The strategic management of corporate change' (1993) 46(8) *Human Relations*, 905-918.

There is another sense in which the contingency of change in environmental law and governance can be understood. The preservation of the environment is always contingent on it not being changed to its detriment in the future. This contingency arises from the nature of consumptive and non-consumptive uses of the environment. A non-consumptive use never forecloses a consumptive use, but a consumptive use always forecloses a non-consumptive use.²⁸ Thus, the preservation of an old-growth forest for the recreational activities of bushwalking, bird watching or photography does not foreclose logging the forest at a later date, but clearfelling the forest will preclude these recreational activities that are dependent on there being pristine nature in which the activities can be undertaken. Preservation of the environment is therefore always contingent.

This ever-present contingency of change, indeed the inevitability of anthropogenic change, of the environment evokes a sense of foreboding. One cannot look at an environment without feeling that some human activity causing detrimental change is going to happen soon. It is not a question of if, only when, change is going to happen.

This brings me to my first artist who has captured this foreboding of change. Olive Cotton (1911-2003) was a pioneering Australian modernist photographer of the 1930s and 1940s. Her black and white photograph “Beach Landscape (Sand Dunes)” (1938) captures the temporality of a coastal dune in NSW. There is a foreboding of change in three respects.



Olive Cotton, “Beach landscape (Sand Dunes)” (1938)

²⁸ Brian J Preston, ‘Third party appeals in environmental law matters in New South Wales’ (1986) 60 *Australian Law Journal* 215, 221 and see J E Krier, “Environmental Litigation and the Burden of Proof” in M. F. Baldwin and J. K. Page, *Law and the Environment* (a Conservation Foundation Publication, Walker & Co, 1970).

First, the warning in the sky. The stretch of sky inspires creative imagination – to entertain possibilities and to be inventive. Think of the saying, “blue sky thinking”. But the high cirrus clouds forewarn of a change coming in the next 24 hours, most likely in south eastern Australia a cold front linked to a low-pressure system bringing rain. The photograph captures the dynamism of weather systems.

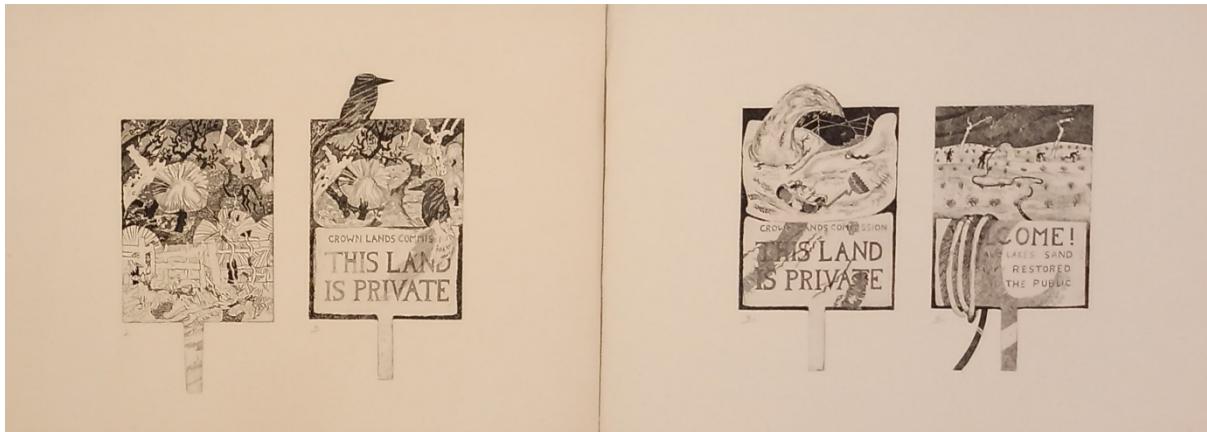
Second, the coastal erosion of the dune. The foredune is exhibiting signs of coastal erosion. Loss of dune vegetation exposes dry sand that is easily mobilised, forming depressions or blow outs in the dunes. The cause of dune erosion can be natural but in more recent times is increasingly caused by human activities, including recreational vehicles and bikes, horses, foot traffic and dogs. Climate change exacerbates coastal erosion of the shoreline and coastal dunes, by a rise in sea level, increased tidal inundation, and increased frequency and severity of coastal storms.²⁹ The photograph captures this dynamic coastal erosion process.

Third, the mineral sands below. Beach and dune systems, especially along this stretch of the NSW coast, may contain heavy mineral-sand deposits, such as rutile and zircon. Coastal dunes have been extensively mined in NSW, causing wholesale destruction of the natural dune system, including its physiography and ecology, and long lasting impacts thereafter by rehabilitation with invasive plant species such as Bitou Bush. The environmental laws have proved inadequate to prevent this destructive change of the environment, as many court cases have showed.³⁰ The coastal dune depicted in the photograph embodies this contingency of change. The dune has so far not been exploited, but the existing non-consumptive use cannot foreclose the future consumptive use of sand mining.

The contingency and actuality of change to a coastal dunal system are also depicted by another artist’s work. John Wolseley (1938-) is a renowned Australian artist depicting the landscapes and biodiversity of Australia. His etching “Amen to the Australian Coastline” (1980) is a diptych with two images in each panel, depicting the change wrought by sand mining on the NSW coastline.

²⁹ Recognised in judicial decisions around Australia such as *Northcape Properties Pty Ltd v District Council of Yorke Peninsula* [2007] SAERDC 50 upheld on appeal [2008] SASC 57; *Gippsland Coastal Board v South Gippsland Shire Council (No 2)* [2008] VCAT 1545; *Myers v South Gippsland Shire Council (No 1)* [2009] VCAT 1022; *(No 2)* [2009] VCAT 2414; *Rainbow Shores P/L v Gympie Regional Council* [2013] QPEC 26; *Ralph Lauren Pty Ltd v New South Wales Transitional Coastal Panel* (2018) 235 LGERA 345; [2018] NSWLEC 207 and *Platford v van Veenendaal* (2018) 229 LGERA 101; [2018] NSWLEC 27.

³⁰ For example, see *Wade v NSW Rutile Mining Co Pty* (1969) 121 CLR 177 and *Associated Minerals Consolidated Ltd v Wyong Shire Council* [1974] 2 NSWLR 681.



John Wolseley “Amen to the Australian Coastline” (1980)

In the first panel, the first image is of a pristine dune forest on Crown land with its abundant birds and wildlife. The unstated but nevertheless implied assumption is that the dune forest is part of the public trust, being open for use and enjoyment by the public.³¹ The second image in the first panel depicts the government action (by the Crown Lands Commission) to alienate the public from using the dune forest. A sign has been erected by the Crown Lands Commission proclaiming “This land is private”. In the second panel, the first image reveals that the government has granted a mining lease of the Crown land allowing the wholesale destruction of the dune. The sign still warns “This land is private”. In the second image in the second panel, sand mining having been completed, attempts at rehabilitation are afoot, with workers planting and watering seedlings of undisclosed nature but, having regard to the history of sand mining, probably exotic plant species such as Bitou Bush. The Crown Lands Commission has changed the sign to announce to the public “Welcome!” and that the lakes and sand in the dune have been “restored to the public”. Truly, the consumptive use of sand mining has foreclosed the non-consumptive use of the formerly pristine dune forest. Wolseley’s diptych is less subtle in its message than Cotton’s subliminal photograph, but both evoke a sense of foreboding of adverse anthropogenic change of the environment.

Chronology of change

Environmental law and governance are premised on linearity of cause and effect and time. This cause has this effect, that cause has that effect, and the effect is always later in time than the cause. This one way direction or asymmetry of time was referred to by astronomer and physicist, Arthur Eddington as the “arrow of time”.³² It refers to the apparent inevitable flow of time from the past to the present and from the present into the future.

According to the special theory of relativity, the reality of the universe can be described by four dimensional space-time. There are three dimensions of space (x, y and z) and

³¹ Bruce Thom, ‘Climate Change, Coastal Hazards and The Public Trust Doctrine’ (2012) 8(2) *MqJICEL* 21-41.

³² Arthur Eddington, *The Nature of the Physical World* (Cambridge University Press, 1928) 328-329.

a fourth dimension of time (t). Time does not actually “flow”, it just “is”. Our perception that there is an arrow of time is but an illusion of consciousness in a particular model of the universe, an emergent quality that we happen to experience due to our particular kind of existence at this particular point in the evolution of the universe.³³

There is a psychological or perceptual arrow of time. This arrow of time is responsible for what it means to be a conscious person. We have an innate sense that our perception runs from the known past to the unknown future. We can remember the past but not the future. We remember representations of the past, in the form of memories, but can only make predictions of the future, which is not as reliable as our memories of the past. The reason lies in the comparative degree of entropy in the past and in the future. Entropy is a measure of disorder. Situations with lower entropy are more ordered; situations with higher entropy are more disordered. The reason we can form a reliable memory of the past is that entropy is lower in the past, events have happened and hence are more ordered.³⁴ The explanation for our ability to make predictions as to the future and choices to change the future is that the future has a higher entropy, events are yet to happen and hence are more disordered.³⁵

Our perception of the arrow of time is largely driven by events and processes at the macroscopic levels – the behaviour of bulk materials that we experience in everyday life – which are time-asymmetric. Natural processes do have a temporal order. The seashore erodes after the wave washes upon it; the river swells after heavy rain falls. Human processes also have a temporal order. The land is barren after the forest is cleared or the minerals are mined.

In contrast, physical processes and laws at the microscopic level are time-symmetric. Newton’s laws, the Schrödinger equation,³⁶ and Einstein’s special and general theories of relativity make no distinction between the past and the future – they are time-symmetric.³⁷ Thus if a physical process is physically possible generally so is the same process done backwards. Hydrogen and oxygen atoms can combine to form water and water molecules can split back to hydrogen and oxygen atoms. The laws of physics at the microscopic level do not necessarily specify an arrow of time.

The observed temporal asymmetry at the macroscopic level – the reason we see time as having a forward direction – is mostly due to the second law of thermodynamics. As we move forward in time, the net entropy, or the degree of disorder, of any isolated

³³ Luke Mastin, ‘The arrow of time’ (online) available at: <<http://www.exactlywhatistime.com/physics-of-time/the-arrow-of-time/>>.

³⁴ Sean Carroll, ‘The Arrow of Time’ (Winter 2010) *Engineering & Science* 20, 23.

³⁵ *Ibid*, 25.

³⁶ The Schrödinger equation is a linear, partial differentiation equation that governs the function of a quantum-mechanical system.

³⁷ Joel L Lebowitz, ‘Time’s Macroscopic Laws and Microscopic Dynamics: Time’s Arrow and Boltzmann’s Entropy’ (1993) 194 *Physica A* 1–97 and Joel L Lebowitz, ‘Boltzmann’s Entropy and Time’s Arrow’ (1993) 46 *Physics Today* 32–38.

or closed system will always increase or at least stay the same. Entropy can be thought of as the tendency of matter and energy to disperse, to become more random.

In thermodynamic systems that are not closed, however, it is possible for there to be localised instances of entropy decreasing with time. The formation of isolated pockets of gas and dust into stars and planets is an example of a decrease in entropy, as these structures have more order, although as the universe as a whole expands the entropy of the universe continues to increase.

Life on Earth is another example of entropy-lowering, order-generating structures. From individual cells, to organisms, to collections of organisms such as ecosystems, life is an adaptive phenomenon responding to constant and changing pressures from the environment, creating and maintaining complexity and order in the face of increasing disorder.³⁸ Many living systems, therefore, may reduce local entropy at the expense of the surrounding environment, resulting in a net overall increase in entropy.

I return to causality, which appears to be intimately bound up with time's arrow. By definition, a cause precedes in time its effects. The identification of causality is evident after the fact, but not necessarily beforehand. Will a particular event or process lead to a particular result, so that the event or process is able to be identified as a cause and the result is able to be identified as an effect? Our current knowledge may be insufficient to identify accurately what is the cause and what is the effect.

The difficulty in identifying causality is compounded by the complexity and polycentricity of natural phenomena and processes and human interference with them. Consider the processes of ecological succession. Frederick Clements, the American grassland ecologist, proposed in the 1920s a theory of predictable change in vegetation communities over time, culminating in a climax state for the community. The climax is the natural vegetation of the region that will develop if large enough areas are left free from outside interference. Clements proposed a "monoclimax" hypothesis, a single type of climax community.³⁹ Successional processes are now known to be far less predictable than proposed by Clements.⁴⁰ This is evident with secondary ecological succession. Secondary ecological succession of an area follows a major disturbance, whether a natural disturbance such as a fire or flood or an anthropogenic disturbance such as logging or mining. There can be different successional series or seres, and thus different seral stages and climax communities, depending on the ongoing natural and anthropogenic conditions and disturbances shaping the succession. Climate change may, for example, materially affect the abiotic

³⁸ Stephon Alexander and Salvador Almagro-Moreno, 'Is life the result of the laws of entropy?' 11 June 2022, *New Scientist: Lost in Space-Time Newsletter*.

³⁹ Michael Allaby, *Basics of Environmental Science* (Routledge, 2nd ed, 2000) 170, 173.

⁴⁰ Harry F Recher, Daniel Lunney and Irena Dunn, *A Natural Legacy: Ecology in Australia* (AS Wilson, 2nd ed, 1986) 120.

environmental conditions for ecological succession,⁴¹ leading to arrested succession short of a climax community.⁴²

I mentioned earlier that the perception that there is an arrow of time, and that causality is bound up with time's arrow, is a product of our way of experiencing the world. That this is not the only way to conceive of time and causality is illustrated by the way in which the indigenous people of the Andes experience time. Francis Gooding explains that:

“Andean time is not a single irreversible flow: the future, the past and the present are imagined as three strands, taking place in simultaneous realities, and arranged as a triple spiral. If these temporal arms are somewhat out of sync, it's the future that is behind, since it's invisible. The past is in front of you: what happened there, or some of it, can be seen. Events on one strand may affect the others, and not in a linear way but in a direct one. Future and past generations are fully alive in Andean time, living on in their times as equally and immediately as you do in yours. Things and places can move between streams, or can be present in more than one; the Andean landscape is alive with concurrent past and future realities, and objects can forge connections between them.

...

Because cause and effect are not in a fixed order, things that have already occurred can still be transformed or reversed. The cause of an event might not have fully happened yet – the future or present can stretch across and change or undo it.”⁴³

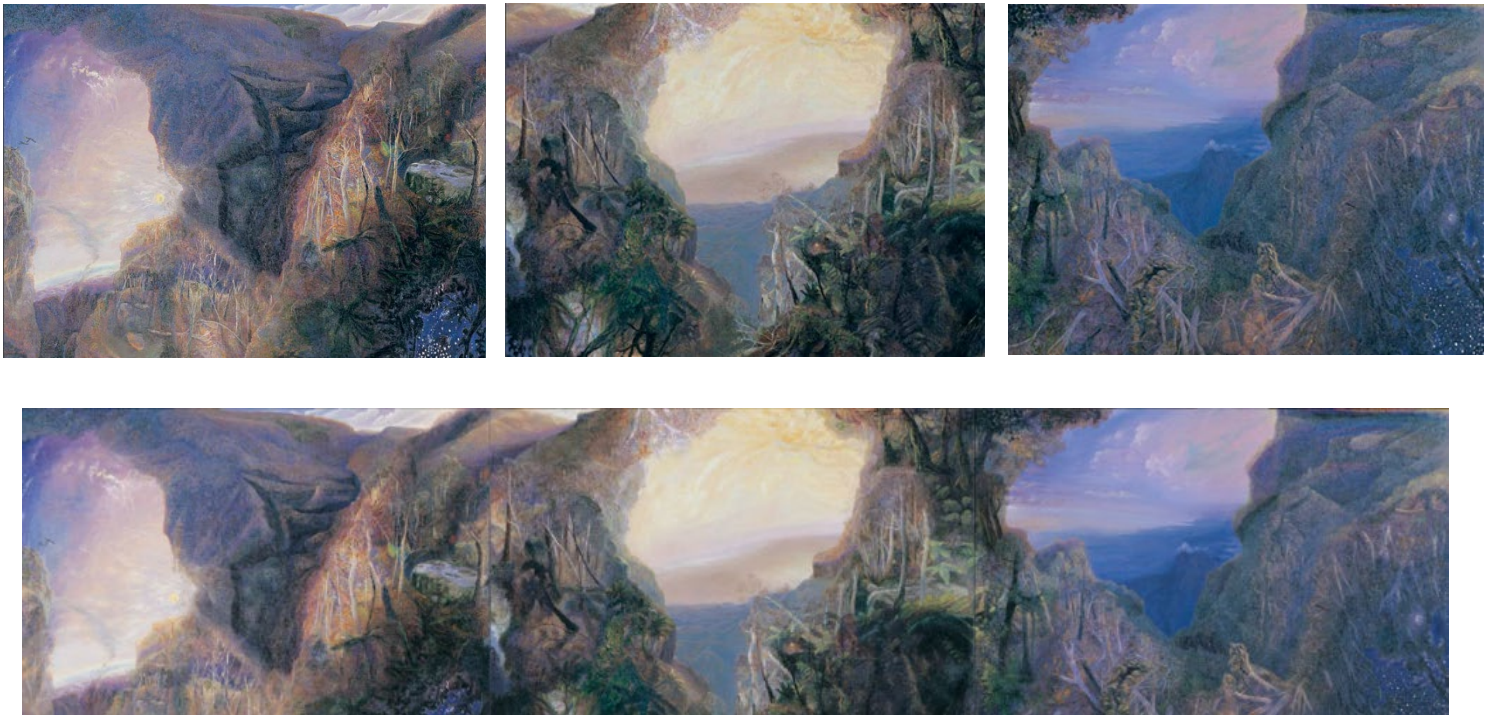
Such experiences of time and causality are not unreal, in the sense of lacking foundation in observed occurrences. As for the Andean experience of time, the world we experience today, the present abiotic and biotic environments, was shaped by and reflects past processes, both natural and human, just as the world we will experience in the future will be shaped by and reflect not only those past processes, but also present processes. In this way, both the past and the future are in front of us in the present. As for the Andean experience of causality, at a microscopic level, physical processes are time symmetric, being able to be done in one direction or the other, so that cause and effect are interchangeable.

Artists can provide insights into how time and causality can be experienced in different ways. William Robinson (1936-), an internationally renowned Australian landscape artist, explores the causal and psychological arrow of time in his monumental (6.4m long) triptych, “Creation Landscape: The Dome of Space and Time” (2003-2004).

⁴¹ Cynthia C Chang and Benjamin L Turner, ‘Ecological Succession in a Changing World’ (2019) 107(2) *Journal of Ecology* 503.

⁴² Allaby, (n 39) 174-176.

⁴³ Francis Gooding, ‘At the British Museum’ *London Review of Books* 44(3), 10 February 2022, 34.



William Robinson “Creation Landscape: The Dome of Space and Time” (2003-2004)

In Vanessa Van Ooyen’s description of the work:

“we see his ingenious use of multi-viewpoint and multi-time composition in the fullness of its complexity, as he captures the landscape through the simultaneous depiction of both space and time. Robinson takes us on a journey from panel to panel, from left to right, as the dome-shaped sky or spheres of light resemble celestial nebulae—depicting sunrise, daylight and sunset. These illuminate the double helix-shaped Springbrook panorama, which encompasses the Nerang River, Tallabanna and Mt Warning. Robinson portrays the mountainous rainforest in great detail, while also conveying impressions of sky, sea and time passing.”⁴⁴

Robinson himself describes his inspiration and intent for the work:

“I have endeavoured to show the revolution of the earth through space and time. In order to achieve this I wanted to include the observer both inside and outside the picture.

The picture implies an on-going existence apart from what is seen ie the twists of the earth can be implied outside the painting from what is seen inside the frame.

I have used the subject of Springbrook. In the central part of the work the golden dome covers the iridescent sea and a band of pink signifies the horizon and the space between the dome and the sea. This horizon is carried throughout the whole of the

⁴⁴ Vanessa Van Ooyen, ‘William Robinson – Genesis’, in *Genesis: William Robinson* (William Robinson Gallery, QUT, 2016) 32.

work and follows the material curve of all the parts. The construction of the painting implies a helix-like twisting of space. The morning sky in the centre is part of the dome which is also implied moving with the other separations of sky and sea. To the left of the centre Tallabanna area with twin falls and fern forest, we move to Purlingbrook Falls and flame trees, then we plunge down the drier slopes to the west, with gums to the Numinbah with the Nerang River. As we move further to the left, a drier bushfire landscape appears. As we move up the Nerang River towards Beechmont, Egg Rock is seen.

The movement to the right across the sea to Mt Warning then moves to night at the bottom right where the earth twists and returns to day at the top right.

The whole construction of my painting is a development which began in 1985...I was searching for ways to include the observer in the landscape. This landscape developed from a static image into one that showed the time of day, the seasons, movement of clouds and ways of showing what is above, behind and in front simultaneously like the many images we take in at once when we are walking in the landscape. I became interested in the world moving through space and revolving. The observer is in the landscape that includes all of these things and is not an outside observer looking into framed static space. I believe the work may be more in the Eastern Tradition of Japanese and Chinese landscape, although I have no direct conscious influence; but sometimes in looking at these works I can see the possibilities of the same intention.

The outside world reaches the edges of the painting and is drawn into its reality. There is a dialogue between the work existing in the frame and the possibility of existence outside."⁴⁵

Robinson also perceives the natural world to have been shaped by and to continue to be shaped by "a complex and multifaceted life force". In his "Creation Landscape: The Dome of Space and Time", Robinson reveals the life within the picture as well as the numinous quality of the natural world.⁴⁶ Through depiction of this life force of the natural world, Robinson reveals how it is possible for order to come from disorder, challenging the notion of the inevitability of an increase in entropy. Robinson's painting reveals a localised instance of order, a reduction in entropy, through his depiction of the creation of the landscape of the Mt Warning caldera, in a world that is otherwise progressing towards disorder, an increase in entropy. This challenges our complacency deriving from our perception of predestiny and inevitability of anthropogenic degradation and destruction of the natural world, the disintegration into disorder. Robinson reminds us that there is a creative life force within the natural world to be cherished and nurtured. This creative life force is responsible for not just the original creation of the world – the birth of the Earth – but also ongoing natural processes, such as ecological succession, that are reshaping the Earth. The rainforest communities of the Mt Warning caldera, so intricately depicted by Robinson, manifest this creative life force.

⁴⁵ William Robinson, *The Transfigured Landscape* (QUT and Piper Press, 2011) 40.

⁴⁶ *Ibid*, 37.

Robinson draws on the psychological or perceptual arrow of time, that we remember the known past, in order to encourage us to make wise choices to change the unknown future. The painting depicts not only flourishing forest but also dead and damaged trees, depicting both life and death, the beginning and the end. This recognises our free will, not predestiny. We are free to choose a future that preserves the integrity, stability and beauty of the biotic community, as Aldo Leopold poetically urged,⁴⁷ rather than be resigned to accept whatever destruction might ensue.

Robinson's work also embraces the four dimensions of special relativity. The three scenes of the broader landscape of the Mount Warning caldera are depicted using the traditional three dimensions of space, but each scene is also viewed from multiple viewpoints, building a multi-spatial perspective. The depicted vistas do not offer a far horizon or vanishing point so as to provide a one-point perspective. Rather, the three-dimensionality of the landscape affords the viewer the experience of being within the landscape, of viewing it from front on, but also from left and right, below and above, just as the viewer would if immersed in the landscape itself.

Van Ooyen observes that in Robinson's landscape, "there is no divide between sea, mountain or sky but, rather, possibilities of a revolving, spherical and interconnected world. One cannot help but think of the möbius strip, something without orientation nor distinction between inside and out".⁴⁸ Similarly, Deborah Hart notes the way in which specific localities are integrated into an imaginatively reconfigured landscape:

"This reconfiguration is revealed in *Creation landscape: The dome of space and time*, in his ongoing experimentation—for instance in the remarkable composition and way that the earth in the foreground appears to rise up and twist in helix-like formations, creating three roughly circular apertures, like windows. Nature has become architecture. The earth frame the central luminous golden dome of the sky and the clouds and ocean tides. It provides the structure through which the viewer engages with the space, moving us in our minds from outside to the inside and even beyond the frame. A subtle horizon-line where the sea meets the sky is continuous across space and across different time-frames, moving back and forth from night to day and back again. As in Robinson's other works in the 'Creation landscape' series there is a sense of the particular being part of constantly evolving and revolving world.

'We know that the world is in fact a sphere which moves around the sun like a helix. As it moves around the sun, darkness and light come at the same time. The golden dome of separation is in the middle of the painting. The painting constantly moves into fields of stars, darkness and sun.'

In this extraordinary painting, movement is combined with a certain separation between viewpoints in the way that the foreground landscape creates the feeling of a cave-like hermetic space for viewing the endlessness of sea and sky. On another level,

⁴⁷ Aldo Leopold, *A Sand County Almanac* (Oxford University Press, 2nd ed, 1966) 262.

⁴⁸ Van Ooyen, (n 44) 28.

the idea of continuing cyclical patterns is emphasised by the circularity of the 'windows'.⁴⁹

To these multi-spatial dimensions is added the temporal dimension, the creation of the landscape over time, giving insight into the space-time relationship. Robinson seeks "a constant movement of light and form to interweave temporal and spatial elements".⁵⁰ Robinson conveys the interdependent relationship between day and night, between past, present and future.

This multi-spatial, multi-temporal perspective engenders in the viewer the sensation of being within the landscape, of travelling through space and time to experience the ongoing creation of the landscapes of the Mt Warning caldera. Robinson invites the viewer to live in the vision itself. We feel enclosed and disorientated by the rainforest trees that loom around us. We witness the physical processes shaping the land, the running streams and eroding hills. We are bathed in the celestial light, the glowing sun and the sparkling stars. We look up at the creator and down upon the creation. But more importantly, we experience the creative force.⁵¹

This creation of the landscape introduces the idea of temporal symmetry. Natural processes shaping the landscape can run either forwards or backwards. The primeval rainforests can be cleared and destroyed – from order comes disorder – but so too can the processes run backwards, such as secondary ecological succession of the disturbed forest back to a climax state – from disorder comes order. The living system can reduce entropy at the expense of the surrounding environment, gaining interconnectedness, integrity and complexity.

Causes of change

The anthropogenic causes of environmental change are multiple and multiplying. One of the most serious threats to the environment is climate change.⁵² The major cause of climate change is anthropogenic emissions of greenhouse gases by fossil fuel extraction and combustion. Last year's Conference of the Parties under the UN Framework Convention on Climate Change and the Paris Agreement, COP 26 in Glasgow, attempted to agree on the early phasing out of coal, the fossil fuel with the greatest emissions, but without success. Countries with vested interests in coal mining and coal-fired power objected. Their objections were in defiance of the accepted science.⁵³ The agreed temperature and time targets under the Paris Agreement

⁴⁹ Deborah Hart, "The Journey Continues..." in Robinson, (n 45) 48.

⁵⁰ *ibid.*

⁵¹ See further, John McDonald, 'William Robinson', Sydney Morning Herald, 1 September 2018 and see also John McDonald, 'The Australian landscape in a visionary's eyes', Sydney Morning Herald, 10 September 1994.

⁵² See *Bushfire Survivors for Climate Action v Environment Protection Authority* [2021] NSWLEC 92 at [69].

⁵³ Intergovernmental Panel on Climate Change, *Global Warming of 1.5°C: An IPCC Special Report on the Impacts of Global Warming of 1.5°C above Pre-industrial Levels and Related Global Greenhouse Gas Emission Pathways* (Report, 2018); Intergovernmental Panel on Climate Change, *Climate Change 2021: The Physical Science Basis*. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change (Report, 2021) and Intergovernmental Panel on Climate Change, *Climate Change 2022: Mitigation of*

cannot be achieved if the world's coal reserves are mined and burned.⁵⁴ Countries' nationally determined contributions to reducing emissions are in aggregate inadequate to achieve the temperature and time targets.⁵⁵

Clearly, cognitive knowledges, particularly in the sciences, have been insufficiently persuasive to drive the needed climate change action. This raises the question, can aesthetic knowledges be more persuasive? Can aesthetic engagement with the causes and consequences of climate change better capture the hearts and minds of decision-makers?

To answer these questions, I turn to another artist, Mandy Martin (1952-2021), a contemporary Australian artist with a national and international reputation for conservation and landscape painting. Her large-scale painting "Vivitur ex raptō (For Bulga)" (2014) depicts the despoliation and disfigurement of the land by open cut coal mining. The painting is part of her "Playing with Fire" series, that addressed the dire consequences for people and planet of the mining and later combustion of coal, leading to global warming. Her message is that in our addiction to fossil fuels, we are truly "playing with fire".

Climate Change. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change (Report, 2022).

⁵⁴ Christopher McGlade and Paul Ekins "The geographical distribution of fossil fuels unused when limiting global warming to 2°C" (2015) *Nature* 517, 187-190 and see the evidence of Professor Steffen, earth systems scientist, in *Gloucester Resources Ltd v Minister for Planning* (2019) 234 LGERA 257; [2019] NSWLEC 7 at [446]-[447].

⁵⁵ Intergovernmental Panel on Climate Change, "Climate Change 2022: Mitigation of Climate Change, Working Group II Contribution to the IPCC Sixth Assessment Report: Summary for Policymakers" (Report, 4 April 2022) [B.6].



Mandy Martin “Vivitur ex raptō (For Bulga)” (2014)

The painting’s title is drawn from Ovid’s *Metamorphoses*, Book 1: 144, “Vivitur ex raptō”, roughly translated as “it is lived from stealing”. The open-cut coal mine depicted abuts the rural village of Bulga in the lower Hunter Valley of NSW; hence the painting’s dedication “For Bulga”. Martin perceived the open-cut coal mine to live by stealing. It steals the past, both Aboriginal and European cultural heritage. The land mined is of cultural significance to the Aboriginal traditional owners of the land and contains Aboriginal objects. The historic Old Great North Road, built in the 1830s by convicts, passed through the site.⁵⁶ The mine steals the present, both ecologically and socially. The site contains one of the largest stands of Warkworth Sands Woodland, a listed endangered ecological community. The mine socially impacts the residents and the community of Bulga. The mine steals the future, not only by damaging and destroying the cultural and natural heritage, but also by its contribution to climate change through the greenhouse gas emissions from the mining and combustion of the coal.

⁵⁶ A different, more southern section of the Old Great North Road is part of the World Heritage listing of the Australian Convict Sites.

The mine causes distributive injustice, inequitably distributing the benefits and the burdens of mining to both present and future generations. Geoffrey Bolton has observed that to the spoiler comes the spoils.⁵⁷ The spoils – the benefits of mining – are distributed not only to the spoilers of the present generation, but are passed down to their heirs. Concomitantly, the spoiled – the burdens of mining – are distributed to others of the present generation as well as being passed down to future generations. Mike Savage observes a return of inequality, where the weight of inequality in the past burdens the present and the future.⁵⁸ As Davies noted about Savage’s recent book:

“Savage proposes most sociologists rethink some of their most basic assumptions about the nature of time and space. In place of the modernist idea of chronology, in which individuals and societies are continually uprooted from tradition and thrust into the unknown, a proper appreciation of wealth inequality forces us to consider time in terms of ‘duration’. It isn’t just wealth that gets passed down from one generation to the next, but costs and risks too. The historical injustice of persistent inequality casts a material shadow over the present, so that contemporary crises – climate breakdown, the pandemic – can be understood as legacies of our predecessors, not as sudden or unforeseeable interruptions. Rather than being a ‘storm’, as Walter Benjamin described it, history is a perpetual process of sowing and reaping.”⁵⁹

These severe present and future impacts of the Warkworth coal mine led the Land and Environment Court of NSW to refuse development consent to an extension of the mine.⁶⁰ However, the NSW Government later granted consent for the mine extension, thereby ensuring the severe environmental and social impacts.⁶¹

EIA of a project like the Warkworth coal mine at Bulga sanitises and desensitises the assessment of the environment and the impacts of the project on the environment. Quantitative hard values trump qualitative soft values, as Laurence Tribe has observed.⁶² This is the force of Martin’s painting. It de-sanitises and sensitises the viewer’s assessment of the affected environment and the impact that open-cut mining is having on the environment. The dystopia and disfunction of the minescape confronts the viewer. Martin’s painting involves revelatory imagination, for both artist and viewer,

⁵⁷ Geoffrey Bolton, *Spoils and Spoilers: A History of Australians Shaping Their Environment* (Allen & Unwin, 1981).

⁵⁸ Mike Savage, *The Return of Inequality: Social Change and the Weight of the Past* (Harvard University Press, 2022).

⁵⁹ William Davies, ‘Destination Unknown’ *London Review of Books* 44(11), 9 June 2022, 15, 16.

⁶⁰ *Bulga Milbrodale Progress Association v Minister for Planning and Infrastructure & Warkworth Mining Ltd* (2013) 194 LGERA 347; [2013] NSWLEC 48, appeal dismissed in *Warkworth Mining Ltd v Bulga Milbrodale Progress Association Inc* (2014) 200 LGERA 375; [2014] NSWCA 105. See also Amanda Kennedy, *Environmental Justice and Land Use Conflict: The Governance of Mineral and Gas Resource Development* (Routledge, 2017).

⁶¹ See Brian Robbins ‘Warkworth mine extension moves closer to winning approvals’ *Sydney Morning Herald*, 27 November 2015 <<https://www.smh.com.au/business/warkworth-mine-extension-moves-closer-to-winning-approvals-20151022-gkfrwb.html>> and ‘Hunter Valley residents lose battle against mine expansion’ *ABC News Online*, 27 November 2015 <<https://www.abc.net.au/news/2015-11-27/hunter-valley-residents-lose-battle-against-mine-expansion/6980352>>.

⁶² Laurence H Tribe, ‘Technology Assessment and the Fourth Discontinuity: The Limits of Instrumental Rationality’ (1972-73) 46 *Southern California Law Review* 617, 627; Laurence H Tribe, ‘Ways not to think about plastic trees: New foundations for environmental law’ (1974) 83 *Yale Law Journal* 1315, 1317-1322.

where the perceptual and imaginative engagement with the minescape engenders new ideas and meaning, or revelation.⁶³ The depicted wasteland emotively and intellectually engages the viewer and engenders revelation of the environmental crisis. In this way, shock and awe might be more persuasive than science and economics.

Consequences of change

Just as science and statistics on the causes of climate change are failing to persuade decision-makers to act on the causes of climate change, science and statistics on the consequences of climate change are proving equally ineffective. Clinically cataloguing the catastrophic consequences for life on Earth seemingly does not engage decision-makers emotionally or intellectually. Can aesthetic knowledges be more persuasive? I will use a painting by John Wolseley to illustrate how artists can engage the viewer aesthetically and engender revelation of the climate crisis and its consequences, and perhaps thereby inspire the viewer to take action. As Emily Barritt observes: "Making invisible environmental problems visible, thus not only helps the public to understand better the nature of those problems but can also motivate them to do something about them."⁶⁴

Wolseley's painting "Elegy for the coral reefs and the mangroves of the Arafura Sea" (2019) conveys artistically the dire consequences of climate change. His large-scale, multi-media work brings attention to the climate change-induced damage being caused to the coral reefs and mangroves around the coast of the Arafura Sea, in northern Australia. This damage is often overlooked in giving attention to the bleaching of the corals of the Great Barrier Reef.⁶⁵

⁶³ Emily Brady, *Aesthetics of the Natural Environment* (University of Alabama Press, 2003) 157-158.

⁶⁴ Emily Barritt, 'A Review in Three Haikus' (2021) 33 *Journal of Environmental Law* 747, 754.

⁶⁵ See, for example, Graham Readfearn, 'Shocked scientists find 400km of dead and damaged mangrove in Gulf of Carpentaria' *The Guardian*, 3 October 2019 and Jane Bardon, 'NT traditional owners urge climate change policy makers to witness mangrove devastation', *ABC News*, 14 October 2019.



John Wolseley “Elegy for the coral reefs and the mangroves of the Arafura Sea” (2019)

Wolseley entitled his work “Elegy for the coral reefs and the mangroves of the Arafura Sea”. The English word “elegy” has its roots in the Greek word *elegos*, a song of mourning. In English literature, an elegy is a song or poem expressing sorrow or lamentation especially for one who is dead. Here, Wolseley laments the coral reefs and mangroves damaged by rising sea temperatures caused by climate change. The skeletons of the stumps and roots of two dead mangroves stand as silent sentinels, solemnly watching over the tomb of the coral reefs and mangroves of the Arafura Sea. The frontispiece of the tomb, the painting, captures snippets of the life of the coral reefs and mangroves. There are depictions of both hard and soft corals, different bivalves and other marine life. There are depictions of the mangroves, not only their branches but also the imprint of the lifeforce of the mangroves created by rubbing mangrove branches on the paper.

The arrangement of the two sculptural stumps set forward and wider apart than the two painted trunks and branches of the mangroves introduces perspective, drawing the viewer into the solemn space of the memorial for the dead. In that quiet and contemplative space, the viewer can reflect on the elegy.

Another major threat to the environment is loss of biodiversity. The sciences have recorded the exponential decline in biodiversity – the sixth mass extinction – but humanity is insufficiently responsive. Scientific report after scientific report record this extinction crisis,⁶⁶ yet our environmental laws and governance are proving ineffective

⁶⁶ Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, *Nature’s Dangerous Decline ‘Unprecedented’ Species Extinction Rates ‘Accelerating’* (Report, 2019) (n 3); World Economic Forum, *The*

to abate the decline in biodiversity. If the sciences cannot secure the much needed action, can aesthetic knowledges do better?

I will use two paintings that depict a consequence of biodiversity change, species loss, one by Mandy Martin and the other by John Wolseley. The two works grapple with the problem about which Joni Mitchell sang in “Big Yellow Taxi”, namely “that you don’t know what you’ve got till it’s gone”.



**Mandy Martin “Conversations about the Night Parrot at Whistling Duck Creek”
(2014)**

Martin’s painting “Conversations about the Night Parrot at Whistling Duck Creek” (2014) is an elegy for the disappearance of a species, the critically endangered night parrot, and its habitat. Martin wants the viewer to think about the value of the night parrot before its gone. The scene depicted, Whistling Duck Creek, is in the Diamantina Lakes in western Queensland. The painting is seductive – it seems to depict a scenic and serene landscape, but in fact the landscape is surreal and silent. Martin laments a creek without the night parrot and its cry and call enriching the soundscape.

Global Risks Report 2022, 17th Edition (Insight Report, 11 January 2022) and Ian Cresswell et al, *Australia State of the Environment 2021* (Report, 19 July 2022).

Martin achieves this by playing to the inherent curiosity of the viewer to see what is hidden by the visible scene. The Belgian Surrealist, René Magritte observed that:

“Everything we see hides another thing, we always want to see what is hidden by what we see. There is an interest in that which is hidden and which the visible doesn't show us. This interest can take the form of a quite intense feeling, a sort of conflict, one might say, between the visible that is hidden and the visible that is apparent.”⁶⁷

Martin invokes this innate human desire to see what is hidden in two ways. First, how the visible is depicted. The visible, in Martin's painting, is Whistling Duck Creek, an impressionistic, light-spangled, watery scene. By the use of the technique of perspective, the light source appears to be in the background illuminating a path from the foreground. The viewer is enticed to mentally walk down that sparkling path. Where does it go? What will we see when we approach the vanishing point? This is a mystery to be solved. Second, the painting's title, “Conversations about the Night Parrot at Whistling Duck Creek”. The title tantalises the viewer. Where is the night parrot at Whistling Duck Creek? The “visible that is apparent” in the painting does not show us the night parrot. It must be hidden by what we see. But we want to see what is hidden. We mentally invoke an image of a night parrot. We imagine this is what we will see when we walk down that path towards the light. Momentarily we are enlightened. The hidden, the night parrot, becomes visible to us. But it is a fleeting image, a will-o'-the-wisp. We recall the painting's title. There are no more night parrots at Whistling Duck Creek. The waters have fallen silent. With that realisation our image of the night parrot disappears. We now experience a different feeling, a quite intense feeling. We feel the enormity of the loss of the night parrot. We now understand that what was hidden from us was what was lost. That is the powerful message of Martin's painting.

This is evocative of Rachel Carson's classic book, *Silent Spring*.⁶⁸ Carson's title was inspired by John Keats' poem, “La Belle Dame sans merci” and invoked a ruined environment in which “The sedge is withered from the lake, And no birds sing”. Carson's concern was that the indiscriminate use of pesticides, particularly DDT, which are bioaccumulative in the food chain, was killing apex predators such as raptors. She foretold a future where the season of spring would fall silent. Carson's message was echoed by Joni Mitchell in “Big Yellow Taxi” when she sang “Hey farmer, farmer, put away your DDT, I don't care about spots on my apples, Leave me the birds and the bees”.

Martin's painting involves revelatory imagination, the viewer's engagement with the scene reveals the problem of the loss of endangered species, in particular the night parrot.

Wolseley approaches the problem about which Joni Mitchell sang in a different way. His set of paintings “The Harmonic Patterns of Mallee Birdsong – Finch, Eagle and

⁶⁷ Alex Danchev, *Magritte: A Life* (Profile Books, 2021) xxx.

⁶⁸ Rachel Carson, *Silent Spring* (Houghton Mifflin Harcourt, 1962).

"Bush Curlew" (2004) depict not only the birds but also their birdsong that will be lost by the clearing of the birds' habitat in the Mallee, in northern Victoria.



John Wolseley “The Harmonic Patterns of Mallee Birdsong – Finch, Eagle and Bush Curlew” (2004)

Wolseley does so by using a graphic representation of birdsong, a sonogram, as an image in his paintings. He explains: “Sonograms are made by passing the sound of birdsong through a computer program. And they are a graph of the two most important variables of sound, harmonic frequency and the passage of time. They are able to depict the timbre of a bird’s song in a more visual way than traditional musical notations”.⁶⁹ Wolseley depicts the environment as expressed in birdsong: “Like the canary in the mine, [birds] too are a guage or record of the well-being of the earth”.⁷⁰

The collection of smaller sonogram paintings on music stands arranged in front of the larger painting depicting the birds and their birdsong evokes the idea of a musical concert performance. The viewer is at the concert, listening to the symphony of birdsong. This is what will be lost. Wolseley’s paintings again involve revelatory imagination. The viewer’s engagement with the scene reveals not only “what you’ve got” but also does so before “it’s gone”. The viewer is inspired to take action to conserve the birds and their habitat, to maintain the ecological health and well-being of the Mallee.

Complexity of change

A key cause of the failings of environmental law is the complexity of environmental problems. Environmental law, at base, is simply a response to environmental

⁶⁹ Barry Hill and John Wolseley, *Lines for Birds: poems and paintings* (UWA Publishing, 2011) 2.

⁷⁰ John Wolseley, *Carboniferous*, Exhibition Catalogue, Roslyn Oxley9 Gallery, 2010.

problems. The adequacy of that response will depend on the environmental problems to which environmental law is responding. Environmental problems range from the simple to the complex. Environmental law is not needed to solve the simple problems, so tends to be made to solve the complex problems. But it is the very complexity of the environmental problems to which environmental law seeks to respond that causes difficulties.

Fisher and others identify three, closely interconnecting sources of complexity of environmental problems: their collective nature, the way they cross boundaries, and their systematic complexity.⁷¹ One of the features of the collective nature of environmental problems is their polycentricity. A polycentric problem is a many-centred problem, involving multiple issues intersecting and interacting at multiple centres.⁷²

The difficulty in deciding polycentric problems is that because of their ever shifting nature, a decision on one issue causes the other issues to change. Jowell observes:

“Polycentric problems involve a complex network of relationships, with interacting points of influence. Each decision made communicates itself to other centres of decisions, changing the conditions, so that a new basis must be found for the next decision”.⁷³

Conventionally, law and governance systems resolve polycentric problems by simplifying their complexity. Adjudication can do this if a single decision-making criterion can be made dispositive.⁷⁴

Environmental law endeavours to simplify and hence solve polycentric environmental problems using a form of Cartesian reductionism. Under this approach, the meaning or value of the environment lies not in its inherent qualities but in the parts which compose it and the lateral relations of those parts. Reductionism reduces the higher level of meaning and being of the environment into the lower level of its elemental parts. When this reductionism occurs, what is left is not the whole but only its parts.

We see this reductionism in resource law reducing complex ecosystems into individual resources, such as the trees, sands, gravels and minerals that can be exploited. We see this reductionism in property law segmenting, by delineation of property boundaries, complex landscapes with a mosaic of ecosystems. We see it with planning law allowing the development of these segmented parcels of land, without regard to the cumulative impacts across space and time. And we see it with pollution law’s siloed

⁷¹ Elizabeth Fisher, Bettina Lange and Eloise Scotford, *Environmental Law: Text, Cases and Materials* (OUP, 2nd ed, 2019) 25-33.

⁷² Lon Fuller, ‘The Forms and Limits of Adjudication’ (1978) 92 *Harvard Law Review* 353, 395.

⁷³ Jeffrey Jowell, ‘The Legal Control of Administrative Discretion’ [1973] *Public Law* 178, 213.

⁷⁴ See MA Eisenberg, ‘Participation, Responsiveness and the Consultation Process: An Essay for Lon Fuller’ (1978) 92 *Harvard Law Review* 410, 425 and Brian J Preston, ‘Limits of Environmental Dispute Resolution Mechanisms’ (1995) 13 *Australian Bar Review* 148, 167.

approach to the environmental media that are polluted, the air, water and land, without recognition of the interaction of these media.

The antithesis of Cartesian reductionism is the Gaia hypothesis, named after the Greek goddess of Earth. The Gaia theory proposes that all biota and their abiotic environment are closely integrated to form a single and self-regulating complex system, maintaining the conditions for life on Earth.⁷⁵ Earth and its biological systems behave as a huge single entity. The entity has closely controlled, self-regulating, negative feedback loops that keep the conditions on the planet within boundaries favourable to life.

The Gaia theory accords with the phenomenon of life on Earth generating order and lowering entropy. As Alexander and Almagro-Moreno observe:

“This makes an organism an emergent phenomenon, where the final shape of it isn’t contained in the individual pieces that make it up, but can be influenced by a series of larger systems to which it belongs. Living things comprise a network of interactions mediated through the environment. A living system is able to regulate billions of cells to maintain its overall functioning. Beyond that, collections of organisms belong to a network called an ecosystem, which also maintains a dynamical equilibrium.

This extends all the way to networks at life’s largest scales. The idea of Earth being a self-regulating ecosystem was co-discovered by James Lovelock and Lynn Margulis in the 1970s, and it became known as the Gaia hypothesis. The takeaway for us is that the flow of negative entropy exists not only for individual living things, but for the entire Earth.”⁷⁶

Depicting this complex Earth system is challenging for cognitive knowledges that prize reductionism; aesthetic knowledges can assist here. Guy Warren (1921-) is an Archibald Prize-winning, Australian artist with an inventive approach to landscape and human form. Warren’s work reflects a deep conviction of the interdependence of humans and their natural environment and is influenced by the Gaia theory.

One of Warren’s paintings inspired by Gaia theory is “Cave” (1977). This abstract work depicts a geomorphic formation, a cave, as a living entity, a complex of biotic and abiotic components interacting to form a living whole. Warren’s artistic approach is to express the essence of the idea of Gaia as embodied in the object of a cave, rather than to depict the external form of the object of a cave. The idea of Gaia is to be deduced from the abstract design, the lines and spaces, and the contrasting colours. Artistically, Warren achieves this in three ways.

First, Warren uses the contrasting colours of blue and green against red. This captures the perceived polarity of the biotic environment (green for biota), and the abiotic environment (blue for water and red for the earth). Yet it also captures the oneness and interdependence of the biotic and abiotic environments. Biota depend on the

⁷⁵ James Lovelock, *Gaia: A New Look at Life on Earth* (Oxford University Press, 1979).

⁷⁶ Alexander and Almagro-Moreno (n 38).

abiotic environments of water and earth to survive and thrive. Secondly, Warren's abstract design evokes the idea of the veins and arteries of a circulatory system, an integral component of a single lifeform, Gaia.⁷⁷ Red magma squeezes through fissures and spaces and blue water percolates through holes in the ground, providing the growing media for green biota. The admixture of the abiotic and the biotic thereby creates life on Earth. Thirdly, Warren internalises the process of viewing the picture, making the viewer part of the picture. The viewer is drawn into the picture, experiencing the feeling of being in the Earth's womb.



Guy Warren "Cave" (1977)

Warren's work challenges the viewer to re-evaluate how we see the natural world. Conventionally, when we think of a cave, the subject of Warren's painting, we conceive of an inanimate karst formation, perhaps with stalactites and stalagmites, or as a source of limestone to be quarried. But the cave environment may also support life. Caves provide habitat for a diversity of organisms. Photosynthetic organisms are absent, except close to cave entrances. Food chains are based on organic material falling or being washed into caves from terrestrial ecosystems or production by chemoautotrophic bacteria. For fauna, there can be troglobites, animals that spend

⁷⁷ Tony Magnussen, "Of Man and Nature: The Diverse Journey of Guy Warren" in "Of Man and Nature: The Diverse Journey of Guy Warren", Exhibition Catalogue, Gallery Lane Cove + Creative Studios, 2021,

their entire lifecycle within the confines of the cave habitat. Troglobites can be classified as troglofauna (ground dwelling cave animals) and stygofauna (aquatic cave fauna). There can be troglaphiles, animals that often complete their entire life cycle in the cave habitat but can survive in above-ground habitats. There can be troglonexes, animals that live in caves but do not exclusively depend on the caves to complete their lifecycle or daily activities. Certain species of bats are examples. This knowledge of the biota of caves alters our perception of caves. The inanimate becomes animate, the lifeless enlivened.

This change in our perception of caves is illustrated by the decision of the NSW Land and Environment Court in *Newcastle and Hunter Valley Speleological Society Inc v Upper Hunter Shire Council*.⁷⁸ There, a karst formation was to be quarried for limestone. There was a risk, however, that fissures and spaces within the karst might provide habitat for stygofauna. The Court applied the precautionary principle to direct adaptive management in the form of a step-wise approach to undertaking quarrying, requiring surveying and sampling for cave habitat and stygofauna before each stage of quarrying could be undertaken.

Re-imagining environmental law

Environmental law is failing in its central role of regulating humans' exploitation and use of the environment – we are fouling our own nest. One explanation for environmental law's failure is its preferencing of cognitive knowledges, such as scientific and technological knowledges, over perceptual and aesthetic knowledges. This is short-sighted. Cognitive knowledges can generate great insights into the environment and environmental problems, but they cannot tell the whole story. Other voices, other ways of knowing, need to be heard. As Brady observes, “By ignoring the significance of perceptual knowledge or aesthetic knowledge – the knowledge that comes from aesthetic experience and sensitivity to place – cognitive models close off the possibility of these other voices counting in planning and decision-making”.⁷⁹ Brady advocates seeking knowledge pluralism to improve environmental decision-making.⁸⁰

Environmental law needs re-imagining and restructuring to encourage knowledge pluralism. Environmental law needs to change, so that it can deal better with environmental change. This requires seeking out extended and multiple knowledges on the environment and environmental change. A start is to seek out aesthetic knowledges, including the insights of artists who engage with the environment and environmental change. This will change how we view change. And it will change how we deal with change.

⁷⁸ (2010) 210 LGERA 126; [2010] NSWLEC 48 at [153]-[179].

⁷⁹ Emily Brady, (n 63) 99.

⁸⁰ *ibid*, 115.