

A NEW LEGAL PARADIGM: TOWARDS A JURISPRUDENCE BASED ON ECOLOGICAL SOVEREIGNTY

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This paper explores the limitations of existing legal systems that are based on out-dated models of scientific and mechanical paradigms. At present, there is a shift in the understanding about laws; from positivist and natural law theories, which suggest that legal systems are closed logical systems that can be deduced from predetermined rules, to theories that reflect non-hierarchical interconnections that are semblances of, and advocate the protection of, natural ecosystems. The author explains steps taken by other governments to reflect this reordering of the legal paradigm including constitutional changes. Recommendations for the Australian Government to follow this theory are made as the author concludes that the law should align itself with the complex and holistic set of relationships that are found in nature.

I INTRODUCTION

This paper will highlight the limitations of legal philosophies that are still being influenced by a mechanical, scientific paradigm. Such limitations cannot be avoided because that paradigm has shifted. The reasons are obvious: relativity theory and atomic physics have shattered the Newtonian worldview of absolute time and space, of solid matter, and of linear cause and effect. They have also shattered the Cartesian duality, which separated nature into subject/object allusions. Einstein's relativity theory stated that space and time are not separate entities. There are no absolute Newtonian measurements: both space and time are merely descriptive elements. This paradigmatic shift has now been followed by descriptions of natural systems as complex and chaotic, yet relational and interconnected. This paper argues that the two dominant legal theories - positivism and natural law - attempt to impose an anthropocentric jurisprudence on the planet based on acts of conquest and domination and that these theories are flawed. The current, scientific worldview portrays a biosphere that is not just a machine but rather is determined by networks of relationships in non-linear systems that defy an engineered orderliness.

For example, classical Newtonian physics offered an explanation for determining the velocity of a falling object. Like most Newtonian physics, the effects of air resistance or friction were not included. However complexity theory informs us that in order to be accurate in our determinations we will have to include not only friction, but also temperature and air pressure. Then chaos theory makes it clear that we will have to

consider convection, the movement of air particles around the room in order to measure accurately the velocity.

The discoveries inspired by these theories suggest that our existing legal paradigm is also inaccurate and limited. The systemic problem for law is that its chosen model for validation is incomplete. The reliance of natural law theory on an objective, higher authority - on a metaphysical sovereignty, whether divine or natural - has been rejected. Positivist legal theory, which is based on describing the law as it is, is also inadequate. This paper suggests that it is therefore redundant for legal systems to follow an outmoded worldview that is no longer representative of how our world operates. Continued attempts to impose a reductionist legal hegemony on the planet, which fail to recognise that natural systems are interdependent and interconnected, will ultimately prove unworkable. Such attempts will lead only to the entropy predicted by the second law of thermodynamics for such closed systems.

Indeed the essential message of this paper is that the law should align itself with that complex and holistic set of relationships that are described as nature. Thus the paper argues for a jurisprudence that recognises ecological sovereignty. Such jurisprudence, it is proposed, alone can promote the development of laws that are, and ought to be, scientifically verifiable: laws which can thus claim universal legitimacy and authority. Such laws will reflect their interconnectedness with and interdependence on the living systems that form the patterns of life and will verify and be verified by such empirically observed patterns. Such laws will no longer use acts of conquest and fictional sovereignties as justifications for domination. They will not reflect an outmoded mechanised worldview, which ultimately relies on a fictional, constructed sovereignty, that has usurped the authority of the biosphere. Such constructed sovereignties are founded ultimately on acts of violence that result in domination of people and environment and are therefore incapable of abating the current environmental destruction, loss of biodiversity and systemic human misery.

A jurisprudence, which recognises ecological sovereignty on the other hand, offers hope. But what is to be done to remedy its absence? The good news, which this paper offers, is that there are already countries that have embraced this jurisprudence. This paper briefly draws attention to the constitutional arrangements in at least three countries which reflect the paradigmatic shift for which the paper argues. It also discusses briefly four possible avenues for reform that might be pursued in Australia.

A *Positivist Law*

It is important at the outset to recognise that positivism is not exclusively jurisprudential. Its central claim is the view that only empirically confirmed knowledge discovered by the application of a rigid scientific methodology is genuine knowledge. The idea behind positivist legal philosophy is that law is 'posited' or imposed by people. Positivist law is a posited system of norms, as Hans Kelsen described it.¹ As Hart explained, the definition of law does not include a position on

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¹ Hans Kelsen, *General Theory of Law and State* (Russell, New York, 1961) 110-111.

morality, although morals may inform law.² Thus, the validity of law is independent of its content. Legal positivism attempts to explain law as it is rather than, as it ought to be. This is the positivist's claim to scientificity; to focus the conceptual analysis of law on what it 'is' rather than what it should be.

However the 'is' in this equation is a fiction, because the science that informed that 'is' was incorrect. That science was based on an incomplete understanding of the nature of natural systems. Legal positivists were at pains to distance themselves from the unscientific metaphysics of natural law philosophy. They embraced the new scientific understanding of the world. That science however, arose in an era of Cartesian logical analysis confirmed by Newtonian laws of mathematics. Positivists sought to combine empirical observation with rational analysis. Nevertheless, the basic preoccupation for legal theorists remains; what is the source of the legitimacy of law and what makes a law valid? For Kelsen,³ the multitude of legal norms that constitute a system of norms, are interconnected and eventually lead to the *grundnorm* which is not derived but is presupposed and in that sense fictional. For Derrida, the fiction is derived from an act of violence, as a result of conquest. The basic norm is a conceptual point at which the process of derivation stops. This process follows a reductionist approach imbued with the scientific methodology by which legal positivists were influenced. However it does not achieve an empirically grounded explanation for law, but rather ends at a conceptual point, which is in fact fictionally contrived. What this application of scientific methodology demonstrates is that, ultimately, validity is indemonstrable. Law is a constructed system, and its validity is merely a fiction.

The use of fictions has been a vital element in the history of the common law. A legal fiction is an assumption that conceals a change in the rule of law. It can be a postulation that something is legally true regardless of whether it is or not. Such fictions were invaluable expedients for overcoming the rigidity of law.⁴ However, when we retain as a fiction our ultimate sovereignty in the face of empirical evidence to the contrary, the use of the fiction is outmoded. For legal positivists, this attitude was derived from the belief that legal knowledge could only be attained by employing the scientific model of investigation through observation and by subjecting legal theories or hypotheses to empirical discourse. Given the prestige of the scientific approach to inquiry of the era, it is hardly surprising that jurists were persuaded that legal analysis should also be informed and directed by scientific investigation. Thus Bentham's principle of utility was developed in a scientific spirit and was applied to problems of legislating for criminal and civil law.⁵

This science of positivist law⁶ emphasised the distinction between law that actually is and law as it ought to be. Only the former positivist version is the appropriate subject matter of scientific investigation. This means that law is not dependent on any determination of merit in order to be valid. Thus the existence of a law does not depend on whether it ought to be law. It is the contention of this paper, however, that

² HLA Hart, *Law, Liberty and Morality* (Oxford University Press, Oxford 1963).

³ Kelsen, above n 1, 256.

⁴ H.S. Maine, *Ancient Law*, (London: Dent, ed, 1917) 13.

⁵ Jeremy Bentham, *Of Laws in General*, as Quoted in D Lloyd, *The Idea of Law*, (Billing & Sons, London, 1964) 107.

⁶ Ibid 108.

the science of positivist law does not perform its investigation at the requisite level to empirically test the law as it is. The early positivist theorists ignored the sociological observations of law, whilst current theorists have failed to investigate the major shifts in the scientific worldview regarding the way the world operates, namely from the mechanistic to the holistic view of the universe as a system of networks. Law fundamentally is not law if its sovereignty is fictionally based and its authority is antithetical to the support of life. The question is, thus, not what is the law but what is law?

This paper proposes that positivist law that fails to recognise an ecologically based sovereignty is an outmoded and incomplete legal system. It is a legal paradigm that has dominated our common law culture for over two hundred years, but is now receding as a new holistic worldview is revealed and is informing all disciplines including law.

B *Natural Law Theory*

Normative legal theory is concerned with what the law should be. The natural law approach, which conceives of law as having an objective, natural or metaphysical existence, is concerned with values, usually morally informed. There is an inherent tension between what the law is and what it should be, which natural law theory attempts to resolve by reference to norms. The tenets of natural law are binding on us, Aquinas said, because we are guided to them by nature and they are known to us by virtue of our nature. These tenets are a reflection of our natural inclination to choose good over evil.

Any account of natural law will recognise first, natural systems, second, it will stress universality, and third, it will stand as higher law, discoverable by reason. Humans, as opposed to animals participate in this natural law, on the basis of the human capacity to rationalise and therefore to explain our consciousness. As John Finnis observed, “[a] theorist cannot give a theoretical description and analysis of social facts, unless he also participates in the work of evaluation, of understanding what is really good for human persons...”⁷ Finnis is challenging the alleged objectivity of positivists, who base their power of description on scientific methodology, without recognising the participative involvement of subject and object. Nevertheless, Finnis is adamant that, “[there] is something about persons which distinguishes them radically from sub-rational creatures, and which... is intrinsic to the factual reality of every human being.”⁸ This position is derived from Aquinas who, following Aristotle, postulated a separate human intellect or, more recently, recognised as an evolved or natural higher consciousness. The result has been the confirmation of an anthropocentric sovereignty over and the resulting subjugation of the biosphere; the effective hegemony of the planet and all other species by humans.

Both the positivist and natural law theories share this and other common ground. For example, both approaches are informed by critical analysis when seeking to justify the authority of law and the importance of the rule of law. Natural law rejects the very

⁷ John Finnis, ‘Natural Law: The Classical Tradition in Coleman and Shapiro’ in *The Oxford Handbook of Jurisprudence and Philosophy of Law Natural Law and Natural Rights* (Oxford University Press, ed, 1980) 3.

⁸ Ibid 4.

notion of positivist law being a value free account of the description of law. The central idea of the validity of law cannot be value free, hence, attempts to base validity on sovereignty, authority or efficacy fail to recognise the values that underpin the notion of validity. But neither universal, higher source commands, nor posited and accepted rules fully explain reality, as we now know it from recent scientific observations. Both theories are based on incomplete accounts of sovereignty that fail to reflect and to be informed by the reality of living systems.

The reductionist approach of both natural law and positivist law was inspired by a mechanistic worldview. The positivist view is dependent on the concept of sovereign rule and self-verifying procedures. The natural law view is based in a superior, external metaphysical and universal sovereignty. Ultimately both approaches are underpinned by an anthropocentric sovereignty but such sovereignty cannot be imposed on a biosphere that is operating according to non-linear processes rather than reductionist ones. A simple dualistic contradistinction of human versus all other species denies the complexities inherent in nature. Legal positivism was created within a dualistic milieu in the sense that it relied on the persuasive ideology of objectivity to separate law from non-law and to explain law by referring only to law. Natural law theory was likewise created within a dualistic contradistinction based on rationality and a selective understanding of ordained patterns. Law is therefore from either viewpoint, a closed, logical system in which law can be evaluated and deduced from predetermined legal rules by logical means alone.

II THE CHANGE IN SCIENTIFIC PARADIGM

In the seventeenth century the medieval worldview, which had been based on both Aristotelian philosophy and Christian theology, changed radically. The legal system, that had been founded on natural law and divine law and had given rise to an organic, spiritual universe, was replaced by a mechanical, clockwork world. This was a result of the privileging of the 'scientific revolution' associated with the names of Galileo, Descartes, Bacon and Newton. Galileo began by restricting science to the study of phenomena that could be measured and quantified. Descartes followed, creating the methodology of analytical inquiry, which attempted to understand the complex behaviour of the whole by closely analysing the properties of its constituent parts. Descartes' dualism supported the rigorous determinism of the period, dividing the world into subject and object with an objective description of nature being the aim of the scientific process. Newton's synthesis, based on his exact mathematical laws of motion, provided the final nail in the coffin of nature as a living system and of law as representative of a holistic ecosystem.

The Newtonian universe was the three dimensional space of Euclidian geometry, with absolute space and time as a separate dimension unconnected to the material world. Forces acted on matter according to its mass and distance from other matter. All physical effects were reduced to the motion of matter in space caused by the mutual attraction of their gravitational force. The differential calculus equations provided the mathematics for classical mechanics to explain fixed laws of motion.⁹ The enormous success of the Newtonian mechanistic model created the belief that the world indeed operated like a huge mechanical clock according to Newton's laws of motion.

⁹ Fritjof Capra, *The Tao of Physics*, (Shambhala Publications, ed, 1999) 55.

However, the exploration of the atomic and subatomic world early in the twentieth century challenged the Cartesian view of the world and the mechanistic perceptions of Newtonian scientists. The first challenge to the rigid rules of forces acting on matter was the new theory of electromagnetism, which replaced a force with a force field. This gave rise to the realisation that light is an electromagnetic wave, which soon developed into an understanding of electromagnetic radiation, recognising that light was dualistic in nature, capable of being simultaneously a wave and a particle. In their efforts to grasp the new reality they had discovered, scientists realised that they needed a new language to explain the paradoxes.

Quantum theory forced classical physicists to accept the fact that, at the subatomic level, all solid, material objects dissolve into wave-like potentialities. Moreover, as Aspect¹⁰ and his collaborators showed, photons behave schizophrenically, being either a wave or a particle depending on what the observer is measuring. Furthermore Aspect demonstrated that two electrons, which had once shared an orbit but were subsequently separated by macroscopically large distances, still acted in a coherent manner. The mere fact of determining the spin value of one electron instantaneously disrupted the spin value of the other, thereby defying the principle of locality which stated that particles can only influence each other at speeds less than the speed of light.

The importance of this result is that the nature of the particle cannot exist independently of the observer. The universe, then, would seem to be fundamentally irreducible.¹¹ It is an indivisible and connected universe in which the observer cannot be separated from the observed. Quantum theory has made it clear that atomic and subatomic phenomena can only be understood as links in a chain of processes, the end of which lies in the consciousness of the human observer.¹² The physicist John Wheeler coined the term 'participative universe' to describe this phenomenon: 'in new science the underlying currents are a movement toward holism... giving primary value to the relationships that exist among seemingly discreet parts.'¹³

This is a fundamental change in perception from the Cartesian dualistic approach wherein, now, rather than analysing the parts to determine the whole, the whole determines the parts. Furthermore the whole essentially consists entirely of potentials for interconnectedness. Twentieth century science has realised that complex systems cannot be understood by an analytical or a reductionist approach. There is recognition that single causes can create multiple outcomes. Modern physics has repeatedly shown that the idea of the 'basic building blocks' of nature is no longer tenable.¹⁴ Instead the theories of atomic and subatomic physics revealed the interconnectedness of matter as it is transformed from energy into mass. The reductionist approach to the explanation of complex structures has to be abandoned in order to understand

¹⁰ Alain Aspect, 'Quantum Beats in Continuously Excited Atomic Cascades' (1984) 49(6) *Optics Communications*, 429-434.

¹¹ Danah Zohar, *The Quantum Self: Human Nature and Consciousness Defined by the New Physics*, (Morrow, ed, 1990) 18.

¹² Capra, above n 9, 300.

¹³ Margaret J Wheatley, *Leadership and the New Science* (Berrett-Koehler Publishers, ed, 1992) 44.

¹⁴ Capra, above n 9. 280.

complex living systems. In the new worldview, the universe is seen as a dynamic web of interrelated events. None of the properties of any part of this web is fundamental. The lack of those properties follows from the properties of the other parts and the overall consistency of their mutual interrelations determines the structure of the entire web.¹⁵ The hologram has been used as an analogy for this implicated order because it is characteristic of the holographic image that each of its parts in some sense contains the whole.

The impact of the mechanistic view of how the universe operates, with its focus on objects rather than relationships, inevitably led to common law notions of separation: of person from place, of person from purpose, of law from morality. It privileged the subjective consciousness of humans by assuming that life can be reduced to matter and space. This view, it could be noted, has been found to correlate closely with the erosion of our humanity and our attendant human values, as well as with the subjugation of all other species.¹⁶ In the Cartesian approach, human relationships are the product of observation, whereas, from the quantum perspective, our human relationships are integral to our very being. And more than that, such relationships occur on a multiplicity of planes and depend upon the complexity of our interactions that, in turn, are the result of the unpredictable, the spontaneous, and the metaphysical.¹⁷

III CRISIS OF PERCEPTION

The problems that face the world are ultimately different facets of a singular problem: a crisis of perception.¹⁸ The crisis is derived from an outmoded worldview. The quantum revolution of the twentieth century forced physicists to reassess for the first time in 200 years their ability to explain the universe. They were faced with paradoxes rather than with answers. In their struggle to understand the emerging reality they realised that they needed a new language as well as a new way of thinking in order to explain atomic phenomena. It took physicists some time to accept these paradoxes as an integral part of atomic physics. As Werner Heisenberg wrote:

The violent reaction to the recent development of modern physics can only be understood when one realises that here the foundations of physics have started moving; and that this motion has caused the feeling that the ground would be cut from under science.¹⁹

Thus did relativity theory and atomic physics shatter the Newtonian worldview? Space is not three-dimensional and time is not a separate entity. Both are connected in a fourth dimensional space-time continuum. Mass is nothing but a form of energy according to $E=mc^2$: “the creation of material particles from pure energy is certainly

¹⁵ Ibid 286.

¹⁶ Robert Lawlor, *Voices of the First Day, Awakening the Aboriginal Dreamtime* (Inner Traditions International, ed, 1991) 41.

¹⁷ As explained by the ineffable beauty of fractals: see John Briggs and David Peat, *The Quantum Self: Human Nature and Consciousness Defined by the New Physics* (New York: Quill/William Morrow, 1990).

¹⁸ Fritjof Capra, *The Web of Life* (Anchor Books, ed, 1996) 4.

¹⁹ Werner Heisenberg, *Physics and Philosophy*, quoted in Fritjof Capra, *The Web of Life* (Anchor Books, ed, 1996) 38.

the most spectacular effect of relativity theory..."²⁰ The Newtonian worldview perceived matter as being the indestructible elementary object.

Particle accelerator experiments have shown a further paradox. When highly energised particles collide, they do break, but the size of the broken pieces are the same as the size of the original pieces, created from the kinetic energy involved in the collision. This paradox is unfathomable if we retain a reductionist approach to understanding. There are no fundamental building blocks, which ultimately explain the whole due to their constituent parts. Instead there is energy and the potential for interconnection. The Cartesian view of subject and object and the Newtonian view of cause and effect lose their meaning at the subatomic level of life. According to Einstein's theory, the force of gravity affects space and time by curving it. This is beyond the capacity of three-dimensional Euclidean geometry to explain. Those rules do not work for curved surfaces. Thus, the concepts of absolute space and time are meaningless and the concept of empty space loses its meaning. Space is conventionally felt as distance, the emptiness separating objects. Our understanding of space depends on our notion of time and our language, with the same words that measure distance and describe space also describing time.

Australian Aborigines do not perceive space as distance. Space for them is consciousness and, like consciousness, space is divided into two modes. The perceptible, tangible entities in space are like the conscious mind and the invisible space between things corresponds to the unconscious mind. The term unconscious is misleading; the unconscious mind is always conscious, it is a continuum of dreaming...permeating all levels of existence, just as space fills everything from galaxies to the interior of atoms.²¹

However, the concepts of empty space and solid objects are still deeply ingrained in western consciousness, despite the fact that they have lost their meaning in studies of cosmology and the infinitely large, and atomic physics and the study of the infinitely small. It is very difficult for the western mind, influenced by almost 300 years of Cartesian duality, to accept that something can be at the same time, a particle-something with a minute volume, and a wave- something without volume and spread over a large area of space. Atomic physicists explained this apparent contradiction by showing that matter; at the sub atomic level does not exist with certainty, but rather only with existential tendencies. Similarly it has been discovered that, atomic events do not occur with certainty of time and space, but rather show tendencies to occur. Careful observation of subatomic processes has shown that isolated separate entities do not exist but can only be understood as interconnections between observer (experimenter) and the observed (measurement). Isolated particles of matter are an abstraction. At the atomic level, the classical perception of solid materials of atomic building blocks dissolve into patterns of energy and these patterns do not represent probabilities of matter forming but rather probabilities of interconnection of energetic relationships. Thus the properties of any atomic object can only be understood in terms of the interaction with the observer. The Cartesian partition is an illusion.

²⁰ Fritjof Capra, *The Tao of Physics* (Harper Collins Publishers, 4th ed, 2000) 77.

²¹ Lawlor, above n 16, 41.

This change in perception of the atomic world, greatly shocked scientists in the twentieth century because it meant that natural systems could not be understood by analysis. The Cartesian paradigm was predicated on the belief that every complex system of behaviour could be reduced to its parts and analysed. Twentieth century experiments showed that the properties of the parts are not intrinsic properties but can be understood only by reference to the whole system. Furthermore these natural systems are dissipative, importing energy and exporting entropy.

Ultimately, as quantum physics explained, there are in fact no parts at all; what we call a part is merely a pattern in a systems network, an organised web of relationships. In the mechanistic view, the world is a collection of objects, which interact with each other and have relationships, but these relationships are secondary. The great realisation from the study of systems theories is that the objects themselves are networks of relationships, as the sub-atomic observations have proven.²²

The essential properties are the properties of the whole system of relationships, which properties none of the parts has independently. The essential properties of the system arise from the self-organising relations of the parts by the living system. Any isolated or closed physical system will proceed spontaneously towards disorder. According to the second law of thermodynamics, the entropy of a closed system will keep increasing, because entropy is a measure of disorder. By contrast, living systems are open systems, requiring a continual flux of matter and energy in order to keep their environment alive. Self-regulation and self-renewal are the key properties of open systems. Ilya Prigogine made some interesting observations about consciousness when he observed communication between ‘non-living’ chemical solutions. At some point in the reaction between the random mix of molecules, in the chemical clocks he studied, order appeared from the chaos. In the simplest experiment an obtuse grey solution suddenly began pulsing: black then white. All the molecules in the chemical clock were acting simultaneously and in coordination to change their chemical identity. The amazing thing, he said, is that each molecule knows in some way what the other molecule will do at the same time, and this over relatively macroscopic distances. That is a property everybody always accepted in living systems but in non-living systems it was quite unexpected.²³

Thus, if consciousness is the capacity to deal with information, then even inanimate systems have subjective consciousness despite the absence of an identifiable brain. In this sense, consciousness is evidence of the capacity of self-organization from chaos via interpretation of information fields for the purposes of self-regulation.

Legal positivism arose from a Cartesian worldview, an old paradigm based on the belief in the empirical observation of law, as it is, when in fact the worldview which underpinned the law was incomplete. Legal positivism refers to a law that is ‘posited’, that is, a law which is created by humans without due consideration of the coherence of living systems. Law thus became a human construct, without reference to a sovereignty, which is founded in the universal laws of living systems. The positivist stance called for an emphasis on objective facts and legal analysis to underpin its claim to be following the path of scientific inquiry. Until recently, at

²² Capra, above n 9.

²³ Ilya Prigogine and Isabelle Stengers, *Order out of Chaos*, (Bantam Books, ed, 1984) 90.

least, the claims of legal positivism seemed irrefutable as, after all, legal education and practice were founded in the positivist approach. But positivism reinforces the *status quo* and an outmoded worldview: self-validating itself by its insistence that only law can explain law.²⁴ This approach to law is fundamentally flawed because of the incompleteness of the mechanical view of the world that underpins it. This worldview encourages the belief in one right answer, while modern science tells us that the best we can hope for is approximation and therefore limited understanding.²⁵

The contrast between Cartesian dualism, which presupposes separation of subject and object, and the connectivity of complex network systems has correlations with the fractal nature of the cosmos.²⁶ Fractal imagery clarified the inadequacy of the Newtonian space/matter separation and supports the singularity hypothesis²⁷, by explaining the expansion/contraction chaotic nature of non-linear living systems. Similarly, Cartesian analysis separated all cognitive function to the brain only, in a kind of subject/object dualism, while systems theories analysis depicts cognition as holistic and therefore in the body occurring in the endocrine and vascular systems as well.

IV PARADIGMATIC SHIFT TO ECOLOGICAL JURISPRUDENCE

If a paradigm, as defined by Thomas Kuhn,²⁸ is a constellation of achievements or, in this case, concepts and values shared by the legal community then we are in the midst of a paradigmatic shift, a revolutionary break, with the positivist interlude that erroneously assumed an incomplete and fictional sovereignty as its authority for what the law is. The Cartesian worldview with its inherent dualism is no longer descriptive of the world as we know it. The law is being challenged by ecological literacy, which is supported by empirically observed paradoxes that question a reductionist approach. Laws that support and reinforce this outmoded paradigm, by reinforcing the *status quo* are destined for disorder and entropy. The second law of thermodynamics explains the outcome of clinging to a legal system that is not importing feedback from, and being informed by, the ecological basis of all living systems. The subject/object division of Cartesian analysis no longer reflects the interconnectedness of living systems. By contrast systems theories which portray everything connected to everything else reinforce the notion of subject/subject rather than subject/object.

The task of this paradigmatic shift is to reconnect law to the web of life as the sovereign authority for the promulgation of law. By studying and applying lessons from ecosystems, by redefining our legal constellation of achievements to include new concepts, values and revelations of the holistic organisational pattern of the law and legal processes will have empirical legitimacy. In order to implement an ecological jurisprudence, the law needs to be informed by the underlying principles of organization of ecosystems and to reinforce those principles with ecologically literate laws. Modern science has revealed a theory of living systems that provides a

²⁴ John Austin, *The Province of Jurisprudence Determined* (1954); H.L.C Hart, *Law, Liberty and Morality* (Oxford University Press, ed, 1963).

²⁵ Thomas Kuhn, *The Structure of Scientific Revolutions*, (1979); Alan Chalmers, *What is this Thing called Science?* (1976).

²⁶ Zohar, above n 11.

²⁷ Nassim Hamein, 'Crossing the Event Horizon' theresonanceproject.org at 12/12/2011.

²⁸ Kuhn, above n 25.

conceptual framework for the development of an ecological jurisprudence that recognises the biodiversity of life. Recent scientific observations depict an interconnected biosphere and therefore require any conceptual framework to be informed by this expanding and contracting network of relationships.

This is in stark contrast to Francis Bacon's depictions in the seventeenth century of nature as embodying secrets that had to be prised from her by scientific analysis. Ever since Bacon, the goal of science has been to dominate and control nature, for purposes that are predominantly anti-ecological. By contrast, the law can now learn from ecosystems a methodology to support sustainability. During three billion years of evolution, the planet's ecosystems have learned to cooperate in complex patterns in order to maximise sustainability. Based on the understanding of ecosystems as autopoietic networks and dissipative structures, law can derive and formulate a jurisprudence recognising cooperation and organization as the new scientific framework for law making. The new laws must recognise the interconnectedness and the interdependence of the vast networks of relationships that form the biosphere. The law in fact derives its essential properties and its existence from its relationships to all other systems. This requires a shift in perception: from concentration on reducing the law to parts reliant primarily on a human sovereign authority to a broader acceptance of the wholeness of the biosphere and therefore the necessity of human systems to support their interdependence on natural systems. This would result in a shift from subject/object dualism to relationships between subjects, from matter and content to patterns of interconnection. Linear chains of cause and effect rarely exist in ecosystems so law must be constantly importing feedback to avoid the *status quo* and therefore, ultimately, entropy. Law must be informed by the uncertainty of scientific conclusions and the approximation of empirical evidence in order to support legally the precautionary principle and intergenerational equity. For example, a major clash that derives from the collision between ecology and economics is the fact that industrial production is linear while natural systems are cyclical. Law must support the cyclical nature of sustainable patterns by supporting optimum values rather than maximum ones and by reformulating rules of legal personality.²⁹

There is a lack of feedback in the legal system at present. It has become closed to new cognitive processes of responding to current scientific developments. There is a reluctance to embrace cross-disciplinary linkages because of the present positivist reliance on a fictional sovereign authority. Our marketplace economies are simply not sustainable but the law is incapable of responding to the predicament because it is trapped in the positivist paradigm, which refers to law to explain law. As discussed in this paper this paradigm is receding due to the demise of the Cartesian perspective. The law is being slowly informed by cross-disciplinary feedback about the changes in the scientific paradigm. Just as the paradoxical shocks of the twentieth century for science required a new language in order to describe the phenomena, so too law will need a new ecological literacy to describe that very different perception of sovereignty as derived from the biosphere.

If we understand consciousness to be the organising process of cognition for the establishment of the life pattern and structure of the human ecosystem, then language

²⁹ Christopher Stone, '*Should Trees Have Standing; Law, Morality and the Environment.*' (Oxford University Press, 3rd ed, 2010).

is the process of assimilating feedback information for the sustainability of pattern, structure and process. Thus both language and consciousness cannot be private. They are relational. Language becomes universal when it is ecologically literate. Although law is a human construct it is conceivable and edifying to consider it as an autopoietic system: self-regulating, self-renewing and ecologically based. An autopoietic system is one that incorporates a pattern of organization: a structure and a process.³⁰ A pattern is a configuration of relationships that determines the essential properties of the system. The structure is dissipative as described by Prigigone and embodies physically the organisational pattern. The process of life is cognitive involvement in the continual loops and feedbacks to the system.

An autopoietic network is not static. It must constantly regenerate in order to maintain its organization and hence its relationships. Although simple organisms have no brain, they are capable of perception and thus cognition. The organising principles for a self-renewing legal system would be premised on the rights of all living systems to survive and reproduce, in other words to be sustainable. This would require a shift from anthropocentric principles to ecological, earth based principles: where the law supports, legally, biodiversity by supporting the rights of natural systems to exist. It goes without saying that all law will be anthropogenic by its very nature, but that perception does not exclude the sovereign authority for all law being derived from the biosphere's systemic networks. In ecosystems, the complexity of the network is a consequence of its biodiversity and thus a diverse ecosystem is a resilient one. New scientific revelations of the complexity of natural networks and their autopoietic, dissipative structures make it redundant for the law to retain an anthropocentric perspective.

Already some jurisdictions have accepted this realisation. Ecuador, in 2008, enacted a new constitution recognising legally the rights of nature to flourish and procreate. Article 1 of the Rights for Nature Chapter of the Ecuador Constitution reads;

Nature or Pachamama, where life is reproduced and exists, has the right to exist, persist, maintain and regenerate its vital cycles, structure, functions and its processes in evolution. Every person, people, community or nationality, will be able to demand the recognitions of rights for nature before the public bodies.

As a result of this change, an \$8.6 billion judgment was awarded by a court in Lago Agrio, Ecuador, against Chevron for environmental damage in the case *Ecuador v Chevron*, in February 2011.

In April 2010 Bolivia presented a Universal Declaration of the Rights of Mother Earth to the World Peoples' Conference on Climate Change and supports the submission of this document to the United Nations. The Bolivian legislature has adopted this declaration as an Act of Parliament. Article 1 states:

Just as human beings have human rights, all other beings also have rights, which are specific to their species or kind, and appropriate for their role and function within the communities within which they exist. The rights of each being are limited by the rights of other beings and any conflict between their rights must be resolved in a way that maintains the integrity, balance and health of Mother Earth.

³⁰ Capra, above n 20, 156.

On the 29th of April, 2010, the Supreme Court of the Philippines unveiled new rules of procedure for environmental cases, giving individuals standing and protecting them from repercussions when instituting a citizen's action to protect the environment. Citizens can now seek various remedies, including an Environmental Protection Order, for land at risk or subjected to harm. The rules were the result of the Supreme Court Forum on Environmental Justice, which was held in April, 2009.

Recognising legal rights for natural systems is not a new concept, it has been voiced in Christopher Stone's 1975 publication³¹ and Thomas Berry³² has written extensively on the need for a greater law of the biosphere, which includes human law. Berry's insights acknowledged the fundamental changes in the new scientific worldview. The task, in Australia is to find a methodology for implementation of ecological sovereignty as the foundational point for law making.

This paper presents four possible avenues of reform, from an ecological jurisprudence perspective, namely: constitutional, legislative, equitable and international reform.

First, in recognition of the difficulties in achieving constitutional reform in Australia, the present terms of reference of the Constitutional Committee of Inquiry into amending the preamble to the Constitution to recognise indigenous Australians' pre-ownership could be broadened to include a consideration of the recognition of the Aboriginal peoples' relationships to the land and their acceptance of its right to survive and flourish. This could result in a preamble in the following or similar fashion:

We, the Australian nation, thank the Aboriginal people of this country, whose forebears practised a custodianship of this land according to sacred dreamtime laws.

We acknowledge their land management and their culture as the grounds for the present wealth of this nation.

We accept their intrinsic connection to the land as exhibiting the rights of nature to survive and flourish.

This, in turn, could lead to a constitutional basis for the recognition of legal rights for nature, based on the trusteeship of all Australians arising out of their interdependence with the environment already rooted in Aboriginal custom and confirmed by science.

A second approach might be to recognise legislatively that sustainability must include, not only satisfying this generation's needs, but also not diminishing the prospects of future generations. Such conservation acts could embed this concept and legally mandate a precautionary principle requiring respondent developers to provide sufficient evidence of no significant environmental harm, thus, reversing the onus of proof.

Further the requirement for intergenerational equity might be encouraged as an equal first requirement of ecological assessment. This might recognise optimum rather than maximum benchmarks. Such an assessment could be mandated to privilege the

³¹ Christopher Stone, above n 29.

³² Thomas Berry, *The Great Work* (Bell Tower, ed, 2000).

cyclical nature of ecosystems over economic and industrial linear patterns of extraction. Feedback regarding the costs to future generations of effecting restorative work could demand the discontinuation of externalising nature's provision of raw materials. This, in turn, would serve to place greater emphasis on flexibility and diversity as the fundamental self-regulators that enable ecosystems to adapt and survive. Such an emphasis would require a detailed analysis of the actual costs of development, which did not continue to ignore intergenerational and biodiversity equity. Thus acts which cause, or have the potential to cause, widespread, long term environmental harm, and thereby to imperil the health of humans and their conditions for survival together with the risks for survival of other species, could be restricted and the importance of sustainability could be renewed as an effective mechanism for environmental protection.

A third approach could be, for example, that given the right factual matrix, the Supreme Court of Queensland might act according to s126 of the *Supreme Court of Queensland Act 1995*, which states:

It shall be lawful for the Supreme court or any judge thereof in such way as they may think fit to obtain the assistance of...scientific persons the better to enable such court or judge to determine any matter at issue in any cause or proceeding depending in the equity jurisdiction of the court and to act upon the certificate of such persons.

Scientific observations have reinforced that worldview.³³ It is suggested that the Supreme Court of Queensland has an inherent jurisdiction to determine an environmental issue according to the scientific evidence supporting holistic sustainability. It is suggested that given the right factual matrix, one which involved the Crown's power to extinguish the interdependence of the ecosystem and the biosphere, for example the power to grant mining tenements which threaten the internationally recognised human right to survival,³⁴ the Supreme Court could thus apply ecological literacy to determine an outcome that values the sovereign relationships of the biosphere over the linear economic goals of development. The challenge cannot be taken lightly. Decisions from the Land and Environment Courts³⁵ have already highlighted the difficulties of interpreting regulatory provisions that successfully prevent environmental damage, in the absence of an overriding ecological jurisprudence. These decisions highlight the need for a watershed decision to establish equitable boundaries involving a scientifically informed definition of the precautionary principle and intergenerational equity, which underline the right to survival. But there is a precedent already set. The High Court's decision in *Mabo v Queensland (No 2)* recognised native title rights for indigenous Australians. That recognition, it is argued, was premised on the recognition of the custodial relationship

³³ Prigigone, above n 23.

³⁴ *Universal Declaration of Human Rights* art 3. 'Everyone has the right to life...'

³⁵ *Wildlife Preservation Society of Queensland Proserpine/Whitsunday Branch Inc v Minister for the Environment and Heritage* (2006) 232 ALR 510, for the difficulties of establishing direct identifiable impacts on the 'matters of national environmental significance' (MNES) See *Leatch v Director-General of National Parks and Wildlife, Friends of Hinchinbrook Society Inc v Minister for Environment* (No 2) (1997) 69 FCR 28, *Conservation Council of SA Inc v Development Assessment Commission & Tuna Boat Owners Association (No2)* [1999] SAERDC 86, *Telstra Corporation limited v Hornsby Shire Council* (2006) 146 LGERA 10, for judicial discussion of the parameters of the precautionary principle. See *Brown v Forestry Tasmania (No 4)* (2006) 157 FCR 1, for judicial discussion of protection of biodiversity.

indigenous Australians shared with the land. Their approach to land management was holistic, with customary law recognising the rights of all species to survival. It embraced both a subjective and an objective consciousness for all forms of life, animate and inanimate. There is also a recent High Court decision,³⁶ which it is submitted, opens the door to High Court interpretation of matters comprehended by the term ‘protection’, in relation to minimum international environmental standards.

A fourth approach, as mooted by Polly Higgins in her recent publication, *‘Eradicating Ecocide’*, is to extend the jurisdiction of the International Criminal Court to include crimes against the environment as the fifth crime against humanity. This would recognise the global reach of corporations and the reality of the earth as a global non-linear system, self-regulating and self-renewing. It would require best practice procedures for all corporations depending on the scale of perceived environmental damage. The Commonwealth’s power over corporations provides the legal mechanism for regulating environmentally harmful activities endorsed by corporations in the course of their trading activities. The increasing trend to outsourcing and the privatisation of public services would mean that corporate entities might also come within the criminal regulatory provisions. Australia has acceded to the Rome Statute and enacted the International criminal court Act 2002(Cth) to legislate its external affairs obligations.³⁷

V CONCLUSION

Perceptions are insidious and pervasive. They are also difficult to change, especially when they have legal support for their existence. This paper has considered the theoretical foundations of science, philosophy, jurisprudence and law as to what has been described as the environment and now might more helpfully be described as nature. The idea of ecological justice or a jurisprudence based on nature is not new. This paper has made reference, not to ecological justice, but rather to ecological sovereignty. Which expression might be the more appropriate is open to further discussion. Further research is also called for into approaches, which have already been adopted by the judiciary in Australia in more recent times that arguably do perhaps reflect an emerging awareness of an ecological jurisprudence.

But the basic point of this paper has been that the law should align itself, to the extent it is not doing so already, with the complex and holistic set of relationships that are described as nature. Fortunately, examples do exist for the law to emulate and to embrace in order to incorporate ecological literacy within jurisprudence. These examples are found within the new scientific revelations and within the ancient wisdom of indigenous cultures and customary legal theories. Indeed, this paper has offered a measure of hope that such an alignment will occur. It has briefly described certain constitutional arrangements in other countries that do reflect such an alignment and it has posed four possible ways forward to this end in Australia. The development of an ecological jurisprudence may not be so far off into the future as it sometimes seems.

³⁶ *Plaintiff M70/2011 v Minister for Immigration and Citizenship; Plaintiff M106 of 2011 v Minister for Immigration and Citizenship* [2011] HCA 32.

³⁷ On 21/9/2011, the Republic of the Maldives became the 118th State to deposit its instrument of accession of the Rome Statute of the International Criminal Court (ICC) to the United Nations.