

# AN INFORMATION ENVIRONMENTALISM ALMANAC: AND INTELLECTUAL PROPERTY GOVERNANCE PRINCIPLES HERE AND THERE

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*The regulation of information via Intellectual Property Rights (and other laws) is one of the ancient tools of state power. In the information age of the 21<sup>st</sup> century, the governance of information remains a critical issue. There is a tendency to think of the information environment as operating in a parallel universe to the physical environment. Yet there are strong interconnections between these environments'. Moreover, there are governance lessons to be learned from the regulation of the physical environment when considering the regulation of the information environment. This paper seeks to flesh out these lessons with reference to four analytical frameworks derived from contemporary environmentalism: welfare economics, the commons, ecology, and public choice theory. The lessons from each analytical framework can be summarised as follows. Welfare economics highlights the need to focus on costs (as well as benefits) when evaluating regulatory structures. The commons encourages us to query the validity of propertisation. Ecology speaks to the importance of diversity and resilience. And public choice theory hazards against the regulatory effect of concentrated interests. The paper explores the applicability of these insights as they relate to both the physical environment and the information environment. In doing so an information environmental governance framework is proposed.*

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*“A thing is right when it tends to preserve the integrity, stability, and beauty of the biotic community. It is wrong when it tends otherwise.”*

*Aldo Leopold (1949), A Sand County Almanac: And Sketches Here and There, at 262*

## I INTRODUCTION

If spared any thought at all, it is often assumed the physical environment and the information environment operate in separate spheres. But of course both are largely affected by human activity and, in particular, regulatory structures. A key insight of James Boyle’s work is that there are strong parallels to be drawn between the physical environment and the information environment.<sup>1</sup> There are various ways of interacting with this insight. In my work, I seek to develop Boyle’s kernel by fleshing out an ‘information environmental governance framework’.<sup>2</sup> This framework is built upon the theoretical foundations of the contemporary environmental movement that emerged in earnest during the 1960s flowing from Rachel Carson’s *Silent Spring* (among other things).

The contemporary environmental movement was ultimately built upon several insights that can be traced back to four analytical perspectives: welfare economics, the commons, ecology and public choice theory.<sup>3</sup> Each analytic can be applied to the information environment, offering new ways of looking at contemporary regulatory challenges relating to information in the 21<sup>st</sup> century. In general, welfare economics highlights the need to focus on costs (as well as benefits) when evaluating regulatory structures. The commons encourages us to query the validity of propertisation. Ecology speaks to the importance of diversity and resilience. And public choice theory hazards against the regulatory effect of concentrated interests. We will see each insight has applicability to both the physical environment and the information environment.

<sup>1</sup> James Boyle, ‘A Politics of Intellectual Property: Environmentalism for the Net?’ (1997) 47 *Duke Law Journal* 87.

<sup>2</sup> The ‘information environmental governance framework’ is elaborated upon in Robert Cunningham, *Information Environmentalism: a governance framework for Intellectual Property Rights* (Edward Elgar, 2014). This paper seeks to summarise some of the core attributes of this text.

<sup>3</sup> These four analytical frameworks were implicitly referred to in James Boyle’s seminal article: Boyle, above n 1, 113.

The definitive question underpinning this paper is: can governance lessons relating to the physical environment be usefully recast when considering the regulation of the information environment? The answer is yes. Structurally, the paper elaborates on this affirmative rejoinder via the headings of the four said analytical perspectives.

## II WELFARE ECONOMICS

Property rights are an important aspect of law and economic literature.<sup>4</sup> The wisdom goes that such rights are an efficient method of allocating scarce resources because they avoid the need for multiple contractual arrangements. According to the oft-quoted Demsetzian perspective, a key strength of relying upon property within an economic system is that it is a low-cost method of “internalising externalities”.<sup>5</sup> This perspective is synthesised by Henry Smith when he describes property as a “shortcut over all the bilateral contracts (or regulations) that would have to be devised for every pair of members of society in all their various interactions”.<sup>6</sup> That is, A’s right to grow corn on Blackacre as against B’s trampling, same against C, etc; A’s right to park a car on Blackacre as against B, C, etc.<sup>7</sup>

The Demsetzian viewpoint is founded upon two precepts.<sup>8</sup> First, property owners are required to take responsibility for the potential third party costs; and second, property owners are entitled to capture third-party benefits.<sup>9</sup> Building on this foundation, Demsetzian theory implies that property owners’ interests will align with the interests of society, and in turn allocatively efficient

<sup>4</sup> See, eg, Ronald Coase, ‘The Problem of Social Cost’ (1960) 3 *Journal of Law and Economics* 1; Harold Demsetz, ‘The Exchange and Enforcement of Property Rights’ (1964) 7 *Journal of Law and Economics* 11; Harold Demsetz, ‘Towards a Theory of Property Rights’ (1967) 57 *American Economic Review* 347; Henry G Manne, *The Economics of Legal Relationships: Readings in the Theory of Property Rights* (West Publishing, 1975); and Richard Posner, *Economic Analysis of Law* (Aspen Publishing, 1977).

<sup>5</sup> Demsetz, ‘Toward a Theory of Property Rights’, above n 4, 347; Brett M Frischmann and Mark A Lemley, ‘Spillovers’ (2007) 107 *Columbia Law Review* 257, 267–8.

<sup>6</sup> Henry Smith, ‘Toward An Economic Theory of Property in Information’ in Kenneth Ayotte and Henry Smith (eds), *Research Handbook on the Economics of Property Law* (Edward Elgar, 2011) 109.

<sup>7</sup> *Ibid.*

<sup>8</sup> Cunningham, above n 2, 44.

<sup>9</sup> Demsetz, ‘Toward a Theory of Property Rights’, above n 4, 350; John F Duffy, ‘Intellectual Property Isolationism and the Average Cost Thesis’ (2005) 83 *Texas Law Review* 1077, 1080–5 (discussing the requisite of balancing costs and benefits of property rights).

social welfare-maximising decisions will be made.<sup>10</sup> Put simply, according to Demsetzian theory, we can solve many social problems by internalising externalities, and the best method to do this is through strong property rights.<sup>11</sup>

Extending this analysis, economists label environmental pollution as a type of ‘negative externality’. The internalisation of negative externalities is perceived as an effective method of reducing such externalities.<sup>12</sup> This same reasoning has been used in the opposite direction to posit that IPRs are an effective method of ‘internalising positive externalities’.<sup>13</sup> As early as 1901, Sidgwick surmised the relationship between (positive) externalities and IPRs:

External economies [i.e. externalities] are an important aspect of the production of knowledge. The greater the externality, the more inefficient is the final equilibrium. If inventions are completely inappropriable, no profit-maximizing competitor will produce an invention because increases in productivity would be instantaneously erased by a fall in price, and the firm would suffer losses to the extent of its research outlay.<sup>14</sup>

When Sidgwick’s internalisation rationale is adopted wholesale, it stands to reason that the more IPRs the better. This thinking, coupled with the romance of property-based incentivisation arguments, has led to the continual expansion of IPRs over time.<sup>15</sup> This expansionist dynamic is typically referred to as IPR maximalism.<sup>16</sup>

<sup>10</sup> Demsetz, ‘Toward a Theory of Property Rights’, above n 4, 348 (‘every cost and benefit associated with social interdependencies is a potential externality’).

<sup>11</sup> Frischmann and Lemley, above n 5, 267–8.

<sup>12</sup> See, eg. Christine Greenhalgh and Mark Rogers, *Innovation, Intellectual Property, and Economic Growth* (Princeton University Press, 2011) 24–7.

<sup>13</sup> William Baumol and Charles A Wilson (eds), *Welfare Economics: Volume I* (Edward Elgar, 2001) xl–xli citing Henry Sidgwick, *The Principles of Political Economy* (Macmillan, 3<sup>rd</sup> ed, 1901) and William D Nordhaus, *Invention, Growth, and Welfare: A Theoretical Treatment of Technological Change* (MIT Press, 1969) 39.

<sup>14</sup> *Ibid.* Although information is regulated in many different ways, Intellectual Property Rights (IPRs) remain a key governance driver. Of course IPRs are not new. We can trace the deployment of these rights back to the Early Renaissance, and by the time of the Statute of Anne (1709) they are well and truly entrenched.

<sup>15</sup> Contrast, James Boyle, *Shamans, Software, and Spleens* (Harvard University Press, 1997) and Mark A Lemley, ‘Romantic Authorship and the Rhetoric of Property’ (1997) 75 *Texas Law Review* 873, 887 (asking the question that if romantic authorship had explanatory power for IPR maximalism, then why is it that protection for works should change over time?).

<sup>16</sup> Boyle uses peanut butter and jelly sandwiches and Mr. John Moore’s spleen as two exemplars of IPR maximalism. See James Boyle, *The Public Domain* (Yale University Press, 2008) xi (preface) (referring to a peanut butter and jelly sandwich patent in the US – although it was subsequently repealed). See also *Moore v Regents of the University of California* 793 P.2d 479 (Cal 1990), cert. denied, 111 S. Ct. 1388 (1991) discussed in James Boyle, ‘A Theory of Law and Information: Copyright, Spleens, Blackmail and Insider Trading’ (1992) 80 *California Law Review* 1413 (referring

To be sure, propertisation is seductive. Yet property often advances a particular brand of economic efficiency at the expense of other considerations such as distributional justice.<sup>17</sup> In this respect, welfare economic analysis underscores a broader range of considerations. For instance, rather than *internalising* externalities, welfare economics reveals that property rights can actually *hide* externalities. This concealment can be thought of as the ‘veil of property’ or, alternatively, we can speak of ‘exclusivity costs’ associated with property rights.<sup>18</sup>

Furthermore, while property rights are often deployed as a method of overcoming market failure (think climate change and emission trading schemes), there is a live paradox at play here because of the inherent nexus between property rights and markets.<sup>19</sup> That is, by establishing ‘new’ property rights we create fresh markets to overcome ‘old’ market failures. Put another way, ‘the market’ is often used as the default method to overcome ‘market failure’.<sup>20</sup> Interestingly, Demsetz himself implicitly alluded to the circularity embedded within this reasoning:

just as the market dictates that there will be no good X if the cost of producing X exceeds what people are willing to pay for it, so the market dictates that there will be no market if the cost of producing the market exceeds what people are willing to pay for it.<sup>21</sup>

As implied, when it comes to IPRs we can refer to a variety of ‘exclusivity costs’ associated with the veil of property. Welfare economics reminds us to take these costs into account when evaluating the effectiveness of property right systems such as IPRs. The exclusivity costs related to IPRs flow primarily from asymmetry of information, public goods, externalities, and monopolies. The

to the ownership of Mr John Moore’s spleen). For a general discussion of the distinction between IPR maximalism and IPR minimalism see Cunningham, above n 2, 31-2.

<sup>17</sup> Boyle, *Shamans, Software, and Spleens*, above n 15, x.

<sup>18</sup> Aldo Leopold used the phrase ‘veil of property’ in Aldo Leopold, *A Sand County Almanac* (Oxford University Press, 1966) 217. See also, Christopher D Stone, *Should Trees Have Standing? Toward legal rights for natural objects* (William Kaufmann, 1972) x-xi (Garrett Hardin). For a general discussion of ‘exclusivity costs’ as they relate to IPRs see Cunningham, above n 2, Part II.

<sup>19</sup> Cunningham, above n 2, 26-9.

<sup>20</sup> This is referred to as the “externalities paradox” in Cunningham, above n 2, 54. The dynamic reflects a pithy Karl Popper dictum: “every solution to a problem creates new unsolved problems”.

<sup>21</sup> Harold Demsetz, ‘Frischmann’s View of ‘*Toward a Theory of Property Rights*’ (2008) 4(1) *Review of Law & Economics* 127, 131; Brett Frischmann, ‘Spillover Theory and Its Conceptual Boundaries’ (2009) 51(2) *William & Mary Law Review* 801, 814.

detail of these IPR exclusivity costs is outlined elsewhere.<sup>22</sup> But to take one example, by establishing monopoly rights via IPRs we tend to exacerbate distributional costs, which is a type of exclusivity cost. Drahos and Braithwaite explain distributional costs neatly in their classic *Information Feudalism*:

When knowledge becomes a private good to be traded in markets the demands of many, paradoxically, go unmet. Patent-based R&D is not responsive to demand, but ability to pay. The blockbuster mentality of the large pharmas takes them to those markets where there is the ability to pay. Drugs for mental illness, hypertension and erectile dysfunction are where the [pharmaceutical] blockbusters are, not tropical diseases.<sup>23</sup>

Suffice here to reinforce a simple point: just as welfare economics has highlighted the need to take into account environmental pollution when evaluating alternate regulatory options, so too exclusivity costs must be taken into account when evaluating IPR effectiveness. To date, IPR maximalism has mostly triumphed because the benefits of IPRs are keenly celebrated and the (exclusivity) costs largely ignored.

In this way, just as we speak of ‘market failure’, so too we can speak of ‘property failure’. It should be of no surprise marginal utility applies to property (as with everything else).<sup>24</sup> This is why welfare economics seeks to put property in its place as a mediator between private and public interests. When we forget this core function of property, we move down the slippery slope of deploying property to fix every problem under the sun.<sup>25</sup> Yet property is like ice cream – more is not always better.<sup>26</sup> We ignore this lesson at our own peril because the consequence of too much property, whether it be in the physical environment or the information environment, is much more far-reaching and serious than an ice cream hangover.<sup>27</sup>

<sup>22</sup> Cunningham, above n 2, Part II.

<sup>23</sup> Peter Drahos with John Braithwaite, *Information Feudalism: Who Owns the Knowledge Economy?* (Earthscan, 2002) 167.

<sup>24</sup> Paul A Samuelson, ‘A Note on Measurement of Utility’ (1937) 4(2) *Review of Economic Studies* 155.

<sup>25</sup> See Robert Cunningham, ‘Information Environmentalism – towards a digital ecology’ on *Elgar blog* (16 September 2014) <<https://elgarblog.com/2014/09/16/information-environmentalism-towards-a-digital-ecology-by-robert-cunningham/>>.

<sup>26</sup> *Ibid.*

<sup>27</sup> *Ibid.*

### III THE COMMONS

We have seen that the allocation of property rights involves not just benefits but also costs. Once costs and benefits are fully taken into account, it becomes apparent that property is not always the most effective governance tool. Yet even where property is effective, there are dynamic efficiencies to be gained from the interaction between (private) property and the (public) commons. The best way to understand this claim is to imagine a world where everything is privately owned. Not only would such a world be frustrating to live in, it would also be incredibly inefficient. This is a key lesson from the ‘tragedy of ignoring the information semicommons’.<sup>28</sup> The tragedy highlights that real gains flow not just from the commons, but also from the interaction *between* private property and the commons.

Where property proves to be an ineffective governance tool, the question arises: what are the feasible alternatives? Analysing the information environment through the lens of ‘the commons’ is useful in this regard. Formally, the commons can be defined as ‘for joint use, shared; land belonging to the community’.<sup>29</sup> A key attribute of the commons is that no single person or organisation has exclusive control over use or disposition of a particular resource.<sup>30</sup> Rather, those resources governed by commons may be used or disposed of by anyone (within a relevant community) in accordance with rules that may range from ‘anything goes’ to quite crisply articulated formal rules that are effectively enforced.<sup>31</sup>

Loosely speaking, the commons can be thought of as ‘the opposite of private property’.<sup>32</sup> Thinking about the commons in this way is helpful because it underscores the dichotomy between *private* and *public* considerations.

<sup>28</sup> Robert Cunningham, ‘The Tragedy of (Ignoring) the Information Semicommons’ (2010) 4(1) *Akron Intellectual Property Journal* 1.

<sup>29</sup> *The Australian Oxford Pocket Dictionary* (Oxford University Press, 1976). For further discussion concerning the commons see Lawrence Lessig, *The Future of Ideas* (Vintage, 2002) 19–20; Carol M Rose, *Property and Persuasion: Essays on the History, Theory, and Rhetoric of Ownership* (Westview Press, 1994) 105–6 (noting that US legal doctrine has strongly suggested that some kinds of properties should not be held exclusively in private hands but instead should be open to the public or at least subject to public right of use). See also Frank Pasquale, ‘Toward an Ecology of Intellectual Property: Lessons from Environmental Economics for Valuing Copyright’s Commons’ (2006) 8 *Yale Journal of Law and Technology* 79.

<sup>30</sup> Cunningham, above n 2, 72.

<sup>31</sup> Yochia Benkler, ‘The Political Economy of the Commons’ (2003) IV(3) *Upgrade* 6, 6.

<sup>32</sup> James Boyle, ‘Foreword: The Opposite of Property?’ (2003) 66(1) *Law and Contemporary Problems* 1.

Property is often associated with private interests whereas the commons is usually allied to public concerns. There are exceptions, but this is the typical narrative – and there is at least some truth to it.

Pufendorf used the lens of property to discuss the private/public dichotomy thus: ‘the oak tree was no one’s, but the acorns that fell from it became his who gather them’.<sup>33</sup> He also distinguished between positive community (*res communis*) and negative community (*res nullius*).<sup>34</sup> According to the positive community perspective, ‘resources are considered to belong to everyone and therefore any use of such resource is required to be for the benefit of the public at large’.<sup>35</sup> In contrast, the negative community perspective suggests that ‘resources belong to no one and are therefore unclaimed and for the taking’.<sup>36</sup> In short, positive community benefits the weak, whereas negative community benefits the strong.<sup>37</sup>

Both positive community and negative community relate to a central question: under what circumstances should ‘the commons’ be privately propertised? This question is as applicable when considering the information

<sup>33</sup> Craig L Carr (ed.), *The Political Writings of Samuel Pufendorf* (Oxford University Press, 1994) 185.

<sup>34</sup> Anupam Chander and Madhavi Sunder, ‘The Romance of the Public Domain’ (2004) 92 *California Law Review* 1331, 1356, especially footnote 133. This perspective also accords with the ‘positive community’ and ‘negative community’ descriptions discussed by Peter Drahos, *A Philosophy of Intellectual Property* (Dartmouth, 1996), 45–46, 57–59, 65–66, 68.

<sup>35</sup> Drahos, above n 34, 45–46, 57–59, 65–66, 68.

<sup>36</sup> *Ibid.*

<sup>37</sup> It is no coincidence that British invasion of Australia in 1788 was built upon the false doctrine of ‘terra nullius’. Just as colonial powers throughout history have built empires upon the shaky theoretical foundations of private property validation, so too the IPR system is often built upon questionable propositions that flow from authorial (inventive) romance and incentivisation arguments inherent within IPR maximalist discourse. Relevantly, there is some evidence of IPRs being deployed as part of an expansionist mercantile and colonial agenda: see, eg, Susan K Sell, *Private Power, Public Law: The Globalization of Intellectual Property Rights* (Cambridge University Press, 2003). Also see, Cunningham, above n 2, 21; Ruth L Okediji, ‘The International Relations of Intellectual Property: Narratives of Developing Country Participation in the Global Intellectual Property System’ (2003) 7 *Singapore Journal of International and Comparative Law* 315, 324–32; Peter K Yu, ‘The International Intellectual Property Regime Complex: International Enclosure, the Regime Complex, and Intellectual Property Schizophrenia’ [2007] *Michigan State Law Review* 1, 4–5; and Rosa Luxemburg, *The Accumulation of Capital* (Agnes Schwarzschild trans, Routledge, 2003) [trans of *Die Akkumulation des Kapitals* (first published 1913)] (discussing the relationship between Marx’s idea of primitive accumulation and colonialism). For further references concerning the relationship between science and mercantile/colonial expansionism see Lewis Pysenson and Susan Sheets-Pysenson, *Servants of Nature: A History of Scientific Institutions, Enterprises, and Sensibilities* (WW Norton, 1999) 88–90. For a complementary point of view, see William van Caenegem, ‘Intellectual property law and the idea of progress’ (2003) 3 *Intellectual Property Quarterly* 237, 243ff (tying the evolution of IPRs with the notion of ‘progress’).

environment as it is with respect to the physical environment. It also highlights a key point – the commons is a “site of struggle”.<sup>38</sup>

Ultimately, *Information Environmentalism* argues that the ‘positive community’ principle should be applied to the information commons wherever possible.<sup>39</sup> To operationalise this perspective it is necessary to define, or at least clearly delineate, the information commons. How can something be protected if it cannot be defined? This is a real challenge for *Information Environmentalism* because the information commons is inherently abstract with unstable boundaries. Yet if we think deeper, the counterargument is the same can be said for IPRs. Referring to the public domain, which can be conceptualised as a sub-set of the information commons, Deazley states:

the private domain of copyright and copyright’s public domain necessarily share the same boundary – that which is not copyright protected is public domain and vice versa – and that the actual limits and extent of that which is copyright protected is no more readily identifiable and subject to coherent and complete articulation than that which is public domain. The boundary between the two is, and always will be, inherently unstable and unknowable, but that it is unstable and unknowable does not operate to conceptually discredit either phenomenon.<sup>40</sup>

Hence, like the information commons, IPRs are difficult to define – but this has not stopped many from trying.<sup>41</sup> A plethora of court judgments, university subjects, textbooks and peer-reviewed journal articles are directed at exactly that. Why not also direct energy into defining and delineating the information commons? Making progress in this regard will assist in protecting, nurturing and developing the information commons.<sup>42</sup>

<sup>38</sup> Cunningham, above n 2, 21. See also Jeffrey Atteberry, ‘Information/Knowledge in the Global Society of Control: A2K Theory and the Postcolonial Commons’ in Gaëlle Krikorian and Amy Kapczynski (eds), *Access to Knowledge in the Age of Intellectual Property* (MIT Press, 2010) 329; and Lawrence Liang, ‘Beyond Representation: The Figure of the Pirate’ in Gaëlle Krikorian and Amy Kapczynski (eds), *Access to Knowledge in the Age of Intellectual Property* (MIT Press, 2010) 369–70.

<sup>39</sup> See Table 1.1 in Cunningham, above n 2, 20; Ronan Deazley, *Rethinking Copyright: History, Theory and Language* (Edward Elgar, 2006) 131; Drahos, above n 34, 57.

<sup>40</sup> Deazley, above n 39, 131.

<sup>41</sup> Cunningham, above n 2, 124–125, and chapter 4 generally.

<sup>42</sup> James Boyle, ‘The Second Enclosure Movement and the Construction of the Public Domain’ (2003) 66 *Law & Contemporary Problems* 33, 52:

The invention of the concept of ‘the environment’ pulls together a string of otherwise disconnected issues, offers analytical insight into the blindness implicit in prior ways of thinking, and leads to perception of common interest where none was seen before. Like the environment, the public domain must be ‘invented’ before it is saved. Like the environment, like ‘nature,’ the public domain turns out to be a concept that is considerably more slippery than

#### IV ECOLOGY

By applying the commons to the information environment we have seen the utility of defining/delineating the information commons, as well as the importance of applying the ‘positive community’ principle. We now turn to the application of ecology to the information environment.

Ecology has played an important role within the contemporary environmental movement. For example, it has facilitated: a scientific understanding of the natural world, the creation of a set of governance principles, and it has established the basis for an (ecological) ethic.<sup>43</sup> Contemplating how these functions might apply to the information environment proves to be an interesting thought experiment. How might the precautionary principle relate to the regulation of information? Would it be feasible and/or desirable to allocate rights to the information commons? Is it time to start thinking about informational national parks?<sup>44</sup> Such interrogations are not so strange when considering open source production initiatives such as Mozilla Firefox and Creative Commons.

To be sure, using ecology as a normative device to advocate one position or another is inherently fraught. Throughout history all and sundry – from Charles Darwin to Pyotr Kropotkin to Adolf Hitler – have relied upon ecology to support a particular view of both individuals and society.<sup>45</sup> Contemporaneously, the issue of climate change highlights the ideological divide when it comes to ecological thinking (or the lack thereof). There is no need to resolve this ideological divide here. The present concern relates to the application of ecological principles to IPRs. There are many ways in which this could be done. On the practical front, Article 27 of TRIPS and the ‘patenting of

many of us realize. And, like the environment, the public domain nevertheless turns out to be useful, perhaps even necessary.

<sup>43</sup> Cunningham, above n 2, chapter 6. For an insightful discussion of ecology and political ideology see Tim Hayward, *Ecological Thought: An Introduction* (Polity, 1995) 189, arguing that a historical analysis of ecology and politics leads to the political philosophy of anarchism: ‘A strong current of opinion maintains that ecological politics must in fact be a form of anarchism. Certainly, from a historical perspective, it seems to be the case that the most searching ecological questions were raised – long before questions of environment and ecology were of widespread public concern – by anarchists more than by thinkers of other political colours.’ See also, Alan Carter, *A Radical Green Political Theory* (Routledge, 1999) 105.

<sup>44</sup> For further discussion of ‘informational national parks’ see Cunningham, above n 2, 140-5, especially 145 and accompanying references.

<sup>45</sup> *Ibid* 98.

life' could be deployed to explore the interface between IPRs and ecology through the exploration of biotech initiatives.<sup>46</sup> It would also be possible to explore how IPRs interface with 'green technology'.<sup>47</sup> However, the focus at present is on the theoretical linkages and applications of ecology to IPRs.

For our purposes, there are three broad ecology themes worthy of précis: Information Commons Rights, methodological interrelationalism, and diversity/resilience. The paper will now turn to each theme respectively.

### A *Information Commons Rights*

In the 1970s, flowing from the contemporary ecological thinking of the day, legal scholarship emerged which sought to 'bestow legal rights of existence on animate and inanimate objects' within nature.<sup>48</sup> For instance, in 1970 Joseph Sax sought to revitalise the 'public trust doctrine' as a legal instrument for citizens to protect the environment.<sup>49</sup> And in 1972 Christopher Stone published his original work *Should Trees Have Standing?* arguing for the application of legal rights to nature.<sup>50</sup>

Throughout history there has been no hesitation in applying legal rights to information – indeed this is the foundation of IPRs. But IPRs are also built implicitly upon the 'information commons'.<sup>51</sup> While it is true that the information commons is difficult to define, the same can be said for IPRs. In many ways, the information commons is the mirror image of IPRs.

So the question lingers: should we allocate rights to the information commons? This allocation of rights would be called Information Commons Rights (ICRs).<sup>52</sup> Such rights would exist in contradistinction to IPRs. The concept of ICRs is important because 'something does not really exist unless the law deems it to exist'.<sup>53</sup> Moreover, the information commons is not just a critical prerequisite for creativity and innovation but also 'an essential precondition for cultural, social and economic development and for a healthy

<sup>46</sup> Ibid 95.

<sup>47</sup> Ibid.

<sup>48</sup> David Pepper, *The Roots of Modern Environmentalism* (Routledge, 1986) 88-9.

<sup>49</sup> Joseph L Sax, 'The Public Trust Doctrine in Natural Resource Law: Effective Judicial Intervention' (1970) 68 *Michigan Law Review* 471.

<sup>50</sup> Stone, above n 18.

<sup>51</sup> Cunningham, above n 2, 120-3.

<sup>52</sup> Information Commons Rights are discussed at length in *ibid* Chapter 7.

<sup>53</sup> Nicole Rogers (ed.), *Green Paradigms and the Law* (Southern Cross University Press, 1998) 21.

democratic process'.<sup>54</sup> In essence, ICRs would provide 'the public' with an opportunity to speak on behalf of something with no voice.<sup>55</sup> As Christopher Stone suggests, it is no answer to say that the information commons cannot have legal standing (or rights) because it cannot speak:

Corporations cannot speak either; nor can states, estates, infants, incompetents, municipalities or universities. Lawyers speak for them, as they customarily do for the ordinary citizen with legal problems.<sup>56</sup>

### B *Methodological interrelationalism*

The best way of understanding 'methodological interrelationalism', and its relevance to IPRs, is to contrast the 'individualist fallacy' with the 'collectivist fallacy'. The former fallacy flows from omitting 'relevant relational features', whereas the latter fallacy is concerned with 'the illicit attempt to explain certain facts about social individuals in terms of their relations to the totality of which they are a part'.<sup>57</sup> If we map these fallacies to IPRs, for example, we find that IPR maximalists often commit the individualist fallacy when ignoring the social dimensions of creativity and innovation. In parallel, IPR minimalists are sometimes guilty of the collectivist fallacy when seeking to rely upon social production exemplars, such as open source software production, to draw out general conclusions about how creativity and innovation occurs within the information environment as a whole.<sup>58</sup>

Thus, applying methodological interrelationalism to the information environment simultaneously warns against: (i) conflating the role of the individual with respect to creativity and innovation and (ii) assuming all information production can take place within a social production (collectivist) framework. In this way, methodological interrelationalism focuses on how individual parts of a system relate to each other while also simultaneously recognising these relations constitute a system.<sup>59</sup> The 'tragedy of ignoring the information semicommons', alluded to above, adopts this approach by

<sup>54</sup> Lucie Guibault and P Bernt Hugenholtz (eds), *The Future of the Public Domain: Identifying the Commons in Information Law* (Kluwer Law International, 2006) 1.

<sup>55</sup> Stone, above n 18, 17.

<sup>56</sup> *Ibid.*

<sup>57</sup> Carter, above n 43, 82.

<sup>58</sup> Cunningham, above n 2, 102.

<sup>59</sup> *Ibid.* 103.

concurrently focusing on both private property and the commons, along with the dynamic efficiencies that exist between them.<sup>60</sup>

### C Diversity/Resilience

An inherent risk with respect to the information environment is that an over-reliance on property leads to homogenous outcomes. This is partly because IPR maximalism celebrates the benefits of property while at the same time ignoring associated costs. This dynamic results in the facilitation of monopoly power, which in turn serves to diminish diversity within the information environment. As Benkler pithily muses:

The economic returns to exclusive proprietary rights in information are highly concentrated in the hands of those who own such rights ... Monopoly is a good thing to have if you can get it. Its value for rent extraction is no less valuable for a database or patent-based company than it is for the dictator's nephew in a banana republic.<sup>61</sup>

Diversity is one of the key lessons of ecology. In Rachel Carson's classic *Silent Spring*, she explained that by homogenising nature through agricultural practices humans have either consciously or unconsciously set about undermining the 'built-in checks and balances by which nature holds the species within bounds'.<sup>62</sup> The lesson that flows from this understanding is the more diverse a system is the more likely the system will be stable over time and therefore resilient.<sup>63</sup>

<sup>60</sup> Robert Cunningham, 'The Tragedy of (Ignoring) the Information Semicommons' (2010) 4(1) *Akron Intellectual Property Journal* 1.

<sup>61</sup> Yochai Benkler, *The Wealth of Networks: How Social Production Transforms Markets and Freedom* (Yale University Press, 2006) 571. Tangentially, note political power and cultural control have long been keen bedfellows: see Michael D Birnhack, 'More or Better? Shaping the Public Domain' in Lucie Guibault and P Bernt Hugenholtz (eds), *The Future of the Public Domain: Identifying the Commons in Information Law* (Kluwer Law International, 2006) 81. It is for this reason that Foucault has spoken of the 'forensic' and 'warranting' attributes of authorship: see Michel Foucault, 'What is an Author?' in Paul Rabinow (ed.), *The Foucault Reader* (Pantheon, 1969) 108; Rosemary J Coombe, *The Cultural Life of Intellectual Properties* (Duke University Press, 1998) (arguing that according to the conditions of postmodernity, cultural consumption is increasingly understood as an active use rather than a passive dependence upon domination forms of signification). Historically, a crucial function of regulating authorship, and the distribution of information generally, was determining who should be punished when the work of authors violated social, legal or moral norms: see Mark Rose, *Authors and Owners: The Invention of Copyright* (Harvard University Press, 1993) 11.

<sup>62</sup> Rachel Carson, *Silent Spring* (Penguin, 1968) 27.

<sup>63</sup> Rogers, above n 53, 104; Julie E Cohen, 'Creativity and Culture in Copyright Theory' (2007) 40 *UC Davis Law Review* 1151, 1168; and Lawrence Liang, 'The Man Who Mistook His Wife for a Book' in Gaëlle Krikorian and Amy Kapczynski (eds), *Access to Knowledge in the Age of Intellectual Property*

There are various ways of incorporating understandings of diversity within social systems.<sup>64</sup> Competition policy is deployed within the economic domain to foster diversity by looking disfavour-ably upon economic organisation that homogenises rather than diversifies. When this principle is applied to the information environment, we begin to see the “constitutional effect” of IPRs.<sup>65</sup> The application of public choice theory to IPRs is one way of furthering this insight.

## V PUBLIC CHOICE THEORY

Public choice theory implies that public decisions are likely to be detrimental when concentrated interests trump the interests of the collective as a whole.<sup>66</sup> The theory highlights: (i) the regulatory capture/rent seeking activities of concentrated interests, and (ii) the significance for civil society in overcoming collective action problems.<sup>67</sup>

Although the success has been only partial, the contemporary environmental movement has made some inroads by simultaneously counteracting regulatory capture/rent-seeking, while also overcoming collective action problems through civil society organisation activity. Seemingly, it is the (partial) success of the environmental movement, which led Boyle to argue in the late 1990s that information environmentalists should learn from advocates seeking conservation of the physical environment.<sup>68</sup> Part of this project is bringing people from different walks of life together. As Boyle states:

(MIT Press, 2010) 277 (arguing that the IPR system ‘threatens to destroy the diversity that marks our relation to the world of ideas and consequently our relation to others and to ourselves’).

<sup>64</sup> For an example of scholarship concerning the nexus between ecological diversity, agriculture and IPRs, see Roberto Verzola, ‘Undermining Abundance: Counterproductive Uses of Technology and Law in Nature, Agriculture, and the Information Sector’ in Gaëlle Krikorian and Amy Kapczynski (eds), *Access to Knowledge in the Age of Intellectual Property* (MIT Press, 2010) 253.

<sup>65</sup> Brian Fitzgerald, *The Playstation Mod Chip: A Technological Guarantee of the Digital Consumer’s Liberty or Copyright Menace/Circumvention Device?* <[http://eprints.qut.edu.au/1123/1/Sony\\_Appeal\\_Case\\_HighCourtFinal5.pdf](http://eprints.qut.edu.au/1123/1/Sony_Appeal_Case_HighCourtFinal5.pdf)>. An earlier and shorter version of this paper appears in (2005) 10 *Media and Arts Law Review* 89.

<sup>66</sup> James M Buchanan and Gordon Tullock, *The Calculus of Consent: Logical Foundations of Constitutional Democracy* (Michigan University Press, 1962).

<sup>67</sup> Cunningham, above n 2, 147–8, and chapter 9 generally.

<sup>68</sup> James Boyle, ‘Cultural Environmentalism and Beyond’ (2007) 70 *Law & Contemporary Problems* 5, 18.

Right now, it seems to me that, in a number of respects, we are at the stage that the American environmental movement was at in the 1950s or 1960s. At that time, there were people – supporters of the park system, hunters, birdwatchers and so on – who cared about what we would now identify as ‘environmental issues’. In the world of intellectual property we now have start-up software engineers, libraries, appropriationist artists, parodists, biographers, biotech researchers, and others.<sup>69</sup>

By applying public choice theory to the information environment we find that ‘social production’ as an economic production mode can be leveraged to secure better political outcomes.<sup>70</sup> This is because social production is actually more effective at producing certain information goods than the primary alternatives of state-, market- and firm- based production.<sup>71</sup> Why did Wikipedia trump Encyclopaedia Britannica? Even from a purely economic perspective social production can be more efficient than the alternatives.

Although social production is often thought of as a novelty, Benkler reminds such methods have been operating since time immemorial.<sup>72</sup> The disciplines of science, law, education, music, and language all provide examples of non-proprietary social production methodology in action.<sup>73</sup> As Benkler states, ‘non-proprietary strategies have always been more important in information production than they were in the production of steel or automobiles’.<sup>74</sup>

Benkler also highlights that social production within the information domain has long exhibited two key traits: commons-based and decentralist.<sup>75</sup> By fleshing out these traits the “constitutionalism” of the information environment becomes apparent. To explain, constitutionalism is ultimately about power. Most constitutions, particularly within liberal economic democracies, seek to dilute the concentration of control by separating the

<sup>69</sup> Boyle, above n 1, 108.

<sup>70</sup> For a comprehensive discussion of social production, see Cunningham, above n 2, chapter 9.

<sup>71</sup> Ibid chapter 10, particularly 173-82.

<sup>72</sup> Benkler, above n 61, 4; and Yochai Benkler, ‘Coase’s Penguin, or, Linux and the Nature of the Firm’ (2002) 112 *Yale Law Journal* 369, 383. See also, Henry W Chesbrough, *Open Innovation: The New Imperative for Creating and Profiting from Technology* (Harvard Business School Press, 2003); Henry W Chesbrough, *Open Business Models: How to Thrive in the New Innovation Landscape*, (Harvard Business School Press, 2006); and Clay Shirky, *Here Comes Everybody: The Power of Organizing Without Organizations* (Penguin, 2008).

<sup>73</sup> Boyle, above n 42, 47.

<sup>74</sup> Benkler, above n 61, at 4.

<sup>75</sup> Yochai Benkler, ‘The Idea of Access to Knowledge and the Information Commons: Long-Term Trends and Basic Elements’ in Gaëlle Krikorian and Amy Kapczynski (eds), *Access to Knowledge in the Age of Intellectual Property* (MIT Press, 2010) 231.

power of the legislature, executive and judiciary and/or dividing power via federalist structures.<sup>76</sup> When power resides in the political sphere, these methods are reasonably effective. However, as power shifts from the political sphere to the economic sphere, new methods are required to dilute (economic) power. In this way, regulatory structures that impact upon economic power begin to take on a “constitutional” flavour.<sup>77</sup> Competition law and IPRs are exemplary.

To put it plainly, IPRs tend to support the centralisation of economic power, whereas commons-based social production methods tend to foster the decentralisation of economic power. If this statement is accepted, it stands to reason that social production plays a role in fostering the constitutional effect of diluting the concentration of power.<sup>78</sup> When social production is seen in this way it becomes integral to the operationalisation of the ‘separation of economic power doctrine’ advanced within *Information Environmentalism*.<sup>79</sup>

The key to understanding the ‘separation of economic power doctrine’ is to appreciate the significance of the competitive tension that exists between the various productive forces of the state, the market, the firm, and society.<sup>80</sup> In brief, each of the dominant production modes has comparative advantages over the other in a given circumstance. The complexity of this dynamic is dealt with

<sup>76</sup> Anne M Cohler, Basia Carolyn Miller and Harold Samuel Stone (eds), *Montesquieu: The Spirit of the Laws* (Cambridge University Press, 1989) 156–66 (*‘Montesquieu’*). See also Frank Allen Patterson (ed.) *The Works of John Milton, Vol. V* (Columbia University Press, 1932) 132 (where it is argued that ‘In all wise Nations the Legislative Power, and the judicial execution of that power have bin (sic) most commonly distinct, and in several hands: but yet the former supreme, the other subordinat’); and Clinton L Rossiter (ed.), *The Federalist* (Mentor Books, 1961) 322, relaying *Federalist Papers No. 51* where James Madison states: ‘If men were angels no government would be necessary. If angels were to govern men, neither external nor internal controls on government would be necessary. In framing a government which is to be administered by men over men, the great difficulty lies in this: You must first enable the government to control the governed; and in the next place, oblige it to control itself. A dependence on the people is no doubt the primary control on the government, but experience has taught mankind the necessity of auxiliary precautions.’ See also David J Clark, *Principles of Australian Public Law* (LexisNexis Butterworths, 3<sup>rd</sup> ed, 2010) 84. The work of John Locke is also often relied upon in this context. For example, see Peter Laslett (ed.), *John Locke: Two Treatises of Government* (Mentor Books, 1965) 410; and Francesco Farina, ‘Constitutional Economics I’ in Jürgen G Backhaus (ed.), *The Elgar Companion to Law and Economics* (Edward Elgar, 2<sup>nd</sup> ed, 2005) 194.

<sup>77</sup> Cunningham, above n 2, chapter 10.

<sup>78</sup> Robert Cunningham, ‘The Separation of (Economic) Power: A Cultural Environmental Perspective of Social Production and the Networked Public Sphere’ (2010) 11 *Journal of High Technology Law* 1.

<sup>79</sup> Cunningham, above n 2, chapter 10. See also Cunningham, above n 78.

<sup>80</sup> *Ibid.*

elsewhere.<sup>81</sup> To summarise, if we are to manufacture an aeroplane the firm is likely to be most efficient; if we are building public infrastructure such as the National Broadband Network the state is usually pretty effective; if we are considering the delivery of low-barrier-to-entry services such as massage the market does a reasonable job; and if we are concerned with the production of information goods where the allocation of human creativity and/or intellectual input are required – such as computer software – then social production often trumps.<sup>82</sup>

The competitive tension between the productive forces of the state, the market, the firm, and society, leads to important constitutional implications. Facilitating this competitive tension has the effect of militating against the natural tendencies of economic centralisation. Just as the state has found it desirable – rightly or wrongly – to allocate IPRs in order to incentivise the production of information, so too the state might consider fostering competitive tension between the productive forces.<sup>83</sup> Social production is an important part of this equation.

Given that social production tends to be commons-based, it is particularly important to ensure equitable access to the information commons. This in turn will facilitate social production and therefore progress the competitive tension between the productive forces.

## VI INFORMATION ENVIRONMENTAL GOVERNANCE PRINCIPLES

Before concluding, it is useful to set out in table form the governance principles referred to, implicitly and explicitly, throughout the paper. Operationalising these principles is an essential endeavour of *Information Environmentalism*.

<sup>81</sup> Note most production is actually hybridised between the different modes of production. See, eg, *ibid*; Cunningham, above n 2, Part IV.

<sup>82</sup> Cunningham, above n 78; Cunningham, above n 2, Part IV.

<sup>83</sup> *Ibid*.

Analytical frameworks	Information environmental governance principles		
Welfare economics	Account for costs of IPRs and benefits of information commons	Avoid internalising positive externalities where costs exceed benefits	Support initiatives that foster free flow of information
The commons	Delineate parameters of information commons	Apply 'positive community' principle to information commons	Neutralise 'tragedy of ignoring the information semicommons'
Ecology	Build a resilient information environment by facilitating diversity and resilience	Allocate rights and provision legal standing to information commons	Protect, nurture and develop information commons using rhetorical devices such as 'information national parks'
Public choice theory	Guarantee equitable access to information commons	Deploy social production to foster diversity and resilience within information environment	Leverage social production to separate economic power

**Table 1.1:** Information Environmental Governance Principles<sup>84</sup>

## VII CONCLUSION

An implicit theme of *Information Environmentalism* is that the health of the information environment is a key determinant of the natural world; and governance lessons relating to the natural world can be used to secure the health of the information environment. It is a virtuous cycle. However, this cycle only functions successfully if the information commons is protected, nurtured and developed in line with the positive community principle – a resource that belongs to everyone must be used for the public benefit.

It should be of no surprise that parallels might be drawn between human interaction with the physical environment and human interaction with the information environment. After all, such interactions flow from social, political,

<sup>84</sup> Cunningham, above n 2, 20.

economic, cultural, psychological patterns, which in turn inform governance decisions. Drawing out these parallels stresses the futility of crying over spilt milk, but it also reminds that we should avoid habitually spilling the milk (wherever possible).

By applying four analytical frameworks derived from environmental theory – welfare economics, the commons, ecology, and public choice theory – we begin to see the physical world and the information world are not all that different. In both cases, property is used to mediate between private and public interests.

The best way to conclude is to summarise the essence of each of the four analytics discussed within the paper:

- **Welfare economics** underscores the costs (as well as the benefits) of using property as a regulatory tool. In doing so, there is an implicit yet powerful argument that sometimes it is best to *not* proprietise resources – and one way of doing so is by leaving resources in the (information) commons.
- In one sense, everything began in the commons before it became subject to propertisation. Applying **the commons** to the information environment reminds us that propertisation is not the only effective resource management tool. The commons analytic also highlights: (i) even where propertisation is effective, it is still important to appreciate the dynamic interaction between private property and the commons, and (ii) we should apply positive community (*res communis*) wherever possible because doing so moves us away from the ‘might is right’ standard and towards a condition where resources are deployed for the benefit of the public at large.
- **Ecology** gets us thinking about alternative governance perspectives. This is particularly important once it is recognised that property and markets are not the only effective method of allocating resources. In particular, applying ecology highlights the interrelational aspects of society, along with the importance of fostering diversity wherever possible. The information commons is integral to this perspective, and for this reason the creation and maintenance of Information Commons Rights in juxtaposition to IPRs is suggested as a useful thought experiment.

- By highlighting regulatory capture and collective action problems, **public choice theory** speaks to the importance in the 21<sup>st</sup> century of separating not just political power but also economic power. Social production is a vital aspect of this equation because it is an effective competitor in the economic production landscape. In order for social production to continue fulfilling this role, the information commons must be protected, nurtured and developed.

In the end, each analytical framework underscores the importance of the information commons. Protecting, nurturing and developing the information commons requires more than mere wishful thinking; it requires the operationalisation of an information environmental governance framework. This is at once an intellectual and political project.