

Ecology, intellectual property and a five point plan for a sustainable public domain?

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Abstract

At the turn of the century, Harvard evolutionary biologist and all round science polymath Edward O. Wilson wrote that more than 99% of the world's biodiversity was unknown and that we should rectify that state of affairs, since our ignorance was contributing to the destruction of the environment. He outlined a five point plan for doing this.

1. Comprehensively survey the world's flora and fauna. This will need a large but finite team of professionals.
2. Create biological wealth e.g. through pharmaceutical prospecting of indigenous plants. Assigning economic value to biodiversity (e.g. as a source of material wealth as food or medicines or leisure amenities) is a key way to encourage its preservation.
3. Promote sustainable development i.e. "development which meets the needs of the present without compromising the ability of future generations to meet their own needs".
4. Save what remains i.e. being realistic we are not going to halt environmental degradation overnight.
5. Restore the wild lands e.g. through designating large areas of land as natural reserves like Costa Rica's 50,000-hectare Guanacaste National Park.

Could we conceive of a parallel five point plan for protecting the global information store that is the public domain, the diversity of which is potentially endangered by what James Boyle so eloquently argues is a second enclosure movement? At Gikii 4 I believe we can...

A second enclosure movement and digital environmentalism?

We have seen copyright and patent disputes over everything from silence to electronic buttons (eBay v MercExchange) and human genes, young programmers and Ivy league professors jailed or threatened over circumventing drm (Sklyarov, Felten), and a technology company (Apple) dominate online music sales. These and a host of others could just be seen as a string of relatively unrelated intellectual property anecdotes. Taken together, however, they provide significant evidence that James Boyle's theory about an emerging 'second enclosure movement', an enclosure of the commons of the mind, requires serious consideration.¹ The enclosure movement in England between the 15th and 19th-centuries led to big changes in the rural landscape. Formally communally shared land was fenced off and through changes in the law given to big landowners, who in turn divided it up further and rented it out to tenants.

To make things we need resources, including intangible resources like information and ideas. Authors, inventors, creators of all kinds, use language, stories, professional skills, musical notes and chords, facts and ideas, building on the work of earlier creators. Many of these resources are free. A public highway, a public park,

Maxwell's equations or other scientific theories, or a book on which the copyright has expired are all free to use or copy.

These free resources are part of an 'intellectual commons' which anyone can use. It is Boyle's contention, however, that these raw materials of creative intellectual endeavour are increasingly getting fenced off and divided up amongst private owners. Unlike the grassy commons of old England, though, Boyle sees the modern enclosure of 'commons of the mind' as a potentially more worrying development.

The intellectual property system now covers the human genome, business methods, books more than a hundred years old and even collections of facts in a database. These are all things that, for most of the past three hundred years,² intellectual property specialists would not have even conceived of coming within the scope of the system. As Boyle recently said via Twitter:

"1.) We are the first generation to deny our own culture to ourselves.

2.) No work created during your lifetime will, without conscious action by its creator, become available for you to build upon."

Myriad Genetics hold patents on the BRCA1 and BRCA2 genes which indicate a predisposition towards contracting breast and ovarian cancers. In the summer of 2001 the company informed the Canadian province of British Columbia that they would be rigorously enforcing their patent on tests for mutations in these genes. The British Columbia Ministry of Health then stopped funding the tests since the costs of continuing with them would have quadrupled.

What we are getting in the Internet age is intellectual property spreading out with the system covering more things in more ways for longer periods, with greater penalties than ever before. We also have a situation where it is now much easier to infringe intellectual property than ever before. Prior to photocopiers you needed a printing press and a manufacturing plant to copy someone's book. Even with a photocopier it would be a tedious and time consuming process to copy a book. A computer, connected to the Internet, however, puts the tools of mass copying and distribution on the desktop.

Surfing the World Wide Web involves copying. Every time we click on a link we copy a webpage or other digital file. The act of copying something which used to be difficult is now routine. Increasingly broad and continually expanding intellectual property laws, originally designed to regulate industries like publishing and entertainment, now apply to the individual. That can have unintended consequences, like a young Russian programmer getting jailed in the midst of a trip to the US, simply for having done his job in Russia. National laws can have extra-territorial reach. Incidentally, not only was Sklyarov's program legal in Russia, but Russian law requires users to have the facility to make backup copies of digital files. I thought that was a pretty good idea the first time I heard it, especially since I had just purchased my sixth copy of a CD that my elder son, Jack, was particularly fond of when he was little. Modern CDs, unfortunately, have an irritating inclination to get easily scratched.

Boyle asks us to think about the evolution in copying with a monk like Colmcille at one end of a temporal scale, copying out biblical scripts, on to Guttenberg and his printing press in the middle and then the photocopier, tape recorder, video cassette recorder, the Internet and associated technologies at the other end. As we move from Colmcille to the Internet, copying becomes easier and cheaper. The argument therefore goes that we must have stronger intellectual property rights with tougher

penalties, otherwise creators will have no incentive to create. We do not need much intellectual property to guard against Colmcille (though his battle of the book protagonists Finnian and Diarmaid might have disputed this) because it takes so long to copy a manuscript. There are not many people with the skills and materials to do it anyway. On the Internet, though, everyone is a potential copyright infringer.

Does this argument make sense? To a degree yes, if we accept that tools like the Internet are purely vast efficient copying machines. Copying is easier, cheaper and more widespread. However, as is always the case with new technology, it presents us and the entertainment industries with benefits as well as problems. Intellectual property holders can take advantage of communications technologies to vastly reduce distribution costs and increase the possibility of reaching new markets. A music company's back catalogue of songs can be made available digitally at a very low cost and even low volume sales can become profitable.³ Printing a book on demand is now economically feasible and many publishers could have the facility to make their entire back catalogue of books available for order via the Internet. Selling merely half a dozen copies of each of 100,000 out-of-print books could amount to quite a tidy income.

Search engines and other tools can be used to track people engaged in illicit file sharing. Indeed the entertainment industries have investigators monitoring the peer-to-peer file swapping networks, like Kazaa, Morpheus, Limewire, eDonkey, Gnutella or BitTorrent directly. So in deciding whether to expand intellectual property rights to compensate rights holders for some of the downsides of the technology, we should also be looking at the benefits, in order to decide whether they are better or worse off.

Yet with intellectual property, empirical cost-benefit considerations do not feature in the decision making process. No one ever asked the question, when the EU required most member states to extend their copyright term⁴ – how long copyright should last – about what the effect on the market for books was the last time the term had been extended. Given that the various member states had different copyright terms, perhaps it would have been worth comparing the markets in different member states prior to introducing the directive. It is slightly over-simplifying the situation, though not much, to say that industry representatives make a case to legislators that 'it is obvious' that they need bigger, better and stronger intellectual property laws and the law gets passed.

The British Phonographic Industry's campaign to have the term of copyright on sound recordings extended, involved prominent media appearances by singer Cliff Richard. Cliff claimed that ageing recording artists were being deprived of their pensions because of the prospect of losing royalties on 50+ year old recordings. No doubt a retired plumber or teacher would also like to enjoy a continuing substantive income from a day's work done 50 years previously but how likely is that? In any case, when the copyright in a song recording expires, which is likely to sell more copies – a special 50th-anniversary edition recorded by the original artist or an edition recorded by other lesser known artists? Viewed from the right perspective, the expiry of copyright can present a business opportunity, especially since most of the original recordings are just no longer commercially available.

In the US for about the past hundred years, whenever the interested industries have felt the need for a change in the law, e.g. due to the emergence of some new technology, they get together and negotiate an agreement. Their lawyers draft a bill, which gets handed to Congress where it gets passed into law. Jessica Litman describes this process in detail in Chapter 2 of her wonderful book, *Digital Copyright*.

“About one hundred years ago, Congress got into the habit of revising copyright law by encouraging representatives of the industries affected by copyright to hash out among themselves what changes needed to be made and then present Congress with the text of appropriate legislation...

A process like this generates legislation with some predictable features. First of all, no affected party is going to agree to support a bill that leaves it worse off than it is under the current law...

So negotiated copyright statutes have tended, throughout the century, to be kind to the entrenched status quo and hostile to upstart new industries.”⁵

This is how the term of copyright got extended 11 times between 1960 and 1998 in the US. A similar process goes on in the European Union. When the EU considered a directive to ‘harmonise the term’ of copyright, after extensive lobbying by the affected industries, they settled on the longest existing term in an EU country at the time.⁶ In Germany copyright in literary works lasted for the life of the author plus seventy years. The harmonised EU term became the excuse for the US to increase their term to ‘life plus seventy’ in 1998. Similarly recently the EU’s plans to extend the term of copyright in sound recordings from 50 to 70 years just seemed like an ‘obvious’ step to EU Commissioner Charles McCreevy and subsequently the EU parliament approved the measure. In 2003, Mexico extended its term of copyright to life plus one hundred years. It will not be long until the need for parity with Mexico becomes the next rallying call for those looking to have the term further extended in other parts of the world.

Neither is the debate about the term of copyright a new one. Thomas Babington Macaulay made a famous speech on the issue in the House of Commons in 1841, when a fellow member of the House, Thomas Talfourd,⁷ was attempting to get the term extended to the life of the author plus 60 years. Almost every important thing we need to know about copy-right even more than a century and a half later is contained in that speech. Macaulay said:

“The advantages arising from a system of copyright are obvious. It is desirable that we should have a supply of good books; we cannot have such a supply unless men of letters are liberally remunerated; and the least objectionable way of remunerating them is by means of copyright. You cannot depend for literary instruction and amusement on the leisure of men occupied in the pursuits of active life. Such men may occasionally produce compositions of great merit. But you must not look to such men for works which require deep meditation and long research. Works of that kind you can expect only from persons who make literature the business of their lives... Such men must be remunerated for their literary labour. And there are only two ways in which they can be remunerated. One of those ways is patronage; the other is copyright.

There have been times in which men of letters looked, not to the public, but to the government, or to a few great men, for the reward of their exertions... But these cases are exceptions. I can conceive no system more fatal to the integrity and independence of literary men than one under which they should be taught to look for their daily bread to the favour of ministers and nobles. I can conceive no system more certain to turn those minds which are formed by nature to be the blessings and ornaments of our species into public scandals and pests.

We have, then, only one resource left. We must betake ourselves to copyright, be the inconveniences of copyright what they may. Those inconveniences, in truth, are neither few nor small. Copyright is monopoly, and produces all the effects which the general voice of mankind attributes to monopoly...

I believe Sir that I may with safety take it for granted that the effect of monopoly generally is to make articles scarce, to make them dear, and to make them bad. And I may with equal safety challenge my honourable friend to find out any distinction between copyright and other privileges of the same kind; any reason why a monopoly of books should produce an effect directly the reverse of that which was produced by the East India Company’s monopoly of tea... It is good that authors should be remunerated; and the least exceptionable way of

remunerating them is by a monopoly. Yet monopoly is an evil. For the sake of the good we must submit to the evil; but the evil ought not to last a day longer than is necessary for the purpose of securing the good.

...the evil effects of the monopoly are proportioned to the length of its duration. But the good effects for the sake of which we bear with the evil effects are by no means proportioned to the length of its duration. A monopoly of sixty years produces twice as much evil as a monopoly of thirty years, and thrice as much evil as a monopoly of twenty years. But it is by no means the fact that a posthumous monopoly of sixty years gives to an author thrice as much pleasure and thrice as strong a motive as a posthumous monopoly of twenty years. On the contrary, the difference is so small as to be hardly perceptible.

We all know how faintly we are affected by the prospect of very distant advantages, even when they are advantages which we may reasonably hope that we shall ourselves enjoy. But an advantage that is to be enjoyed more than half a century after we are dead, by somebody, we know not by whom, perhaps by somebody unborn, by somebody utterly unconnected with us, is really no motive at all to action...

Now, this is the sort of boon which my honourable and learned friend holds out to authors. Considered as a boon to them, it is a mere nullity, but considered as an impost on the public, it is no nullity, but a very serious and pernicious reality.

I will take an example. Dr Johnson died fifty-six years ago. If the law were what my honourable and learned friend wishes to make it, somebody would now have the monopoly of Dr Johnson's works. Who that somebody would be it is impossible to say but we may venture to guess. I guess, then, that it would have been some bookseller, who was the assign of another bookseller, who was the grandson of a third bookseller, who had bought the copyright from Black Frank, the doctor's servant and residuary legatee, in 1785 or 1786. Now, would the knowledge that this copyright would exist in 1841 have been a source of gratification to Johnson? Would it have stimulated his exertions? Would it have once drawn him out of his bed before noon? Would it have once cheered him under a fit of the spleen? Would it have induced him to give us one more allegory, one more life of a poet, one more imitation of Juvenal? I firmly believe not. I firmly believe that a hundred years ago, when he was writing our debates for the Gentleman's Magazine, he would very much rather have had two pence to buy a plate of shin of beef at a cook's shop underground. Considered as a reward to him, the difference between a twenty years' and sixty years' term of posthumous copyright would have been nothing or next to nothing. But is the difference nothing to us? I can buy *Rasselas* for sixpence. I might have had to give five shillings for it. I can buy the Dictionary, the entire genuine Dictionary, for two guineas, perhaps for less. I might have had to give five or six guineas for it. Do I grudge this to a man like Dr Johnson? Not at all. Show me that the prospect of this boon roused him to any vigorous effort, or sustained his spirits under depressing circumstances, and I am quite willing to pay the price of such an object, heavy as that price is. But what I do complain of is that my circumstances are to be worse, and Johnson's none the better; that I am to give five pounds for what to him was not worth a farthing."⁸

In the EU the list of narrowly focused intellectual property directives, covering special interests like software, audio recordings, rental of copyrighted works, term, databases, satellite and cable broadcasting, digital rights management technologies, and criminal sanctions for breaching intellectual property rights, grows by the year.⁹

The result is arguably a system which, in Europe and individual European countries that have implemented these various directives, lacks overall coherence.

So the argument that 'it is obvious' that new technologies will lead to massive intellectual property infringement, with no compensating benefits, turns out to be a weak one. The evolution and growth of science, law and formal education¹⁰ all fundamentally depended on sharing and testing information without the protection of intellectual property.

Though intellectual property plays an important role in providing creators with an incentive to create and innovate, it is not the only thing that provides that incentive. Shakespeare, Archimedes, Rembrandt, Galileo and Leonardo da Vinci all wrote, created, invented and theorised before intellectual property existed as a legal

construct. J.K. Rowling wrote the first Harry Potter book without the slightest idea that it would transform her life in the way in did.

People create and invent all the time without the prospect of an economic return directly related to their creations. You only have to look at an enthusiastic toddler with some crayons and paper to see this. Often they don't even care if they have paper – they can always find something to use the crayons on. Creativity has always existed and will continue regardless of the state of the intellectual property system. Part of the value of the Internet in this context is that it allows lots of people geographically remote from each other to network cheaply and engage in collaborative creative enterprises.¹¹ How we reward creativity and provide incentives for those to engage in creative works is a question for society. It is my view that a strong but balanced intellectual property system has an important role in this.

The purpose of the intellectual property system is to promote progress. It exists to provide creators with an economic incentive to create and thereby increase the global store of knowledge¹² to which we can all have access. That global store of knowledge is also filled with ideas, inventions, scientific discoveries and facts developed without the benefit of intellectual property. We get access to the intellectual property facilitated part of that global store of knowledge initially for a price, in order, theoretically, that creators can get paid. This pay per access situation lasts as long as the temporary and limited monopoly on the items protected by intellectual property lasts. Once the monopoly runs out we get access, theoretically, for free. So most of the contents of our theoretical global knowledge store should eventually be free or in the public domain. In practice of course these things will not be free, as we still need intermediaries and aggregators like publishers, libraries and internet service providers to supply the books and electronic content, as well as the indices and advice regarding the information that we want or might be interested in.¹³

Boyle's concern is that we are, however, locking these contents up behind laws and digital fences in a way which will have a hugely detrimental effect on the ability of future creators to contribute to the knowledge store.

Nobel Laureate, Richard Feynman, once said "Our responsibility is to do what we can, learn what we can, improve the solutions and pass them on." If we do not have easy access to the raw materials of creativity, like language, stories, know-how, musical notes and chords, facts and ideas, we will not be able to build on what has gone before. An award-winning documentary about the civil rights movement in the US in the 1950s and 1960s, *Eyes on the Prize*, was out of circulation for many years because the fees required to renew the rights on copyrighted materials included in the documentary were too high.¹⁴ Fox wanted to charge another documentary filmmaker, John Else, \$10,000 to use 4.5 seconds of the *Simpsons* which was accidentally included in one of his scenes, on a small TV playing in the background.¹⁵ Is this really what intellectual property should be about?

Boyle and fellow advocates respond to these developments and personal stories of their negative effects with a call for a shared interest in the public domain of knowledge and information (in culture and science).

About 450 million years ago the earth created rich seams of coal under various landmasses, the fuel of choice of the industrial revolution. About 300 million years later it cooked up the large reservoirs of oil which the world so heavily depends on today. There was a lot of coal and oil but not an infinite amount and nothing like the quantity we need to sustain the current levels of consumption through to the end of

the 21st century.¹⁶ The oil, on which 90% of our transportation runs and access to 95% of the goods (including food)¹⁷ in our consumer-driven culture depends, is running out and we are going to need alternative energy sources. It may take a crisis, like the rationing of oil and gas, to make the majority of us really focus on the impact of the oil economy, not just on oil reserves but on the environment in terms of pollution, global warming and climate change. An understanding of the environment can lead us to concentrate on the things that matter e.g. thinking about how high and increasing levels of consumption might affect future generations.

An understanding of the public domain could similarly lead us to consider the impact of our current actions – in the realm of intellectual property and associated digital fences – on future generations' access to knowledge. Boyle believes an articulation of a shared interest in the public domain can lead to a programme of activism and action to protect it, backed up by and intimately related to a programme for scholarship and analysis.

Biodiversity and information diversity

The Internet and its associated technologies are a complex information system with a complex set of ecologies analogous to the environment. Technical experts and ecologists understand, to some degree, the effect that changes to these systems will have. Most of the rest of us do not. That is not a criticism. It is impossible even for the experts to completely understand the knowledge society or the environment in their entirety.

Experts may have a deep understanding of parts of the system but they never know it all and the models they use are simplified representations of some aspect of reality. We do however need this deep understanding if we as a society are to make informed decisions about information systems, particularly those with wide-reaching effects.

In an information society access to, and control of, information is crucial. Who is to ensure that information technologies and the regulations governing them evolve in progressive or positive ways? What political philosophies will underpin this evolution? How, when, where and by whom will such decisions be made?

Sometimes these issues are left to groups of experts who draft legislation, on intellectual property for example, which potentially has a global effect. Yet intellectual property experts pursue lawsuits over silence and electronic buttons and it often takes the ordinary woman on the Clapham Omnibus¹⁸ to throw some common sense into the mix.

If, as Boyle suggests, we need parallel programmes of activism and scholarship to protect the public domain, do we need a kind of sustainable information diversity in our global knowledge store, equivalent to a sustainable biodiversity in our physical and ecological environment? Well it might be worth picking his theory up in some detail and trying to read across some of the ideas of prominent environment scholars to this alternative context.

In 2001, for example, Harvard's multi-award winning evolutionary biologist and all round science polymath, Edward O. Wilson, wrote¹⁹ that more than 99% of the world's biodiversity was unknown and that we should rectify that state of affairs, since our ignorance was contributing to the destruction of the environment. He outlined a five point plan for doing this.

1. Comprehensively survey the world's flora and fauna. This will need a large but finite team of professionals. Wilson estimated that it would take about 25,000 professional lifetimes over a period of 50 years
2. Create biological wealth e.g. through pharmaceutical prospecting of indigenous plants. Assigning economic value to biodiversity (e.g. as a source of material wealth as food or medicines or leisure amenities) is a key way to encourage its preservation.
3. Promote sustainable development i.e. "development which meets the needs of the present without compromising the ability of future generations to meet their own needs".²⁰
4. Do what we can to save what remains i.e. being realistic we are not going to halt environmental degradation overnight.
5. Restore the wild lands e.g. through designating large areas of land as natural reserves like Costa Rica's 50,000-hectare Guanacaste National Park.

So what does such a plan look like when read across to the context of the public domain? Could we conceive of a parallel plan for that global information store, the information diversity of which is potentially endangered by Boyle's second enclosure movement prospectors? Well let's think about each of the five points in turn.

1. Comprehensively survey the world's global knowledge store. Well we may already be some way along the line with this one – with the cooperation of some of the biggest libraries in the World Google has been facilitating the scanning of all the books they can get access to. It's not exactly a scientific survey and the Google book settlement has a phenomenal catalogue (if you'll excuse the pun) of problems associated with it, not least of which is Google's effective monopoly over the digitised version of the world's store of recorded knowledge.
2. We already have vast industries built on information wealth and intellectual property but we need to look at whether those industries are operating in a way which is in the best interests of a society requiring access to knowledge. Part of that will be sorting out the devils in the details of the Google book settlement but it will also mean re-shaping the world's intellectual property landscape in a way that balances the interests of key stakeholders – creators, economic agents and the public – in ways which are much more satisfactory than is currently the case.
3. Promote sustainable information development – information production and exploitation which meets the needs of the present without compromising the ability of future generations to build on that knowledge store. The RSA's *Adelphi Charter*, drawn up by an international commission of artists, scientists, lawyers, politicians, economists, academics and business experts, led by James Boyle, outlines a core set of nine principles to achieve this end.²¹
4. Save what remains e.g. seek to nullify developments in law or technology the primary effect of which is the privatisation of knowledge and information in the public domain.
5. Restore the wild lands. Perhaps we need information reserves or wild lands, like networks of universities and other public institutions, where ideas can be allowed to roam in the wild and the people in these institutions can exchange ideas without the need to deal with proprietary intellectual property claims of the commercial world, at least within the confines of the reserves?

Scientific knowledge is currently at a stage of development whereby the popular belief that we can synthetically create biodiversity is a complete pipedream. Wilson suggested that the "search for the safe rules of biotic synthesis is an enterprise of high intellectual daring". Likewise the interaction of ideas, which creates the kind of information diversity from which emerges other useful ideas, could be stifled by dividing up that public knowledge store amongst private owners. It would be like trying to recreate the biodiversity of the African continent in Dublin Zoo or someone's garden. Wilson is an advocate of using the law to protect biodiversity:

“The wise procedure is to use the law to delay, science to evaluate and familiarity to preserve. There is an implicit principle of human behaviour important to conservation: the better an ecosystem is known, the less likely it will be destroyed.”²²

We could justifiably ask the question of whether intellectual property law, and indeed the whole portfolio of information and communications regulations, could play a similar role with our global information ecosystem.

Ultimately, the success or failure of Boyle’s second enclosure movement rests on the evolutionary battle for dominance between two competing memes – the idea that knowledge should be shared and the idea that it should be controlled. They both have staying power.

When I first read James Boyle’s and Larry Lessig’s work it left me pretty gloomy about the future of the knowledge society, as a natural ‘glass half empty’ kind of guy. In spite of a number of the negative developments since then in the direction of Boyle’s enclosure, though, I am now fairly optimistic about the power of the simple meme that sharing information is a good idea. The trick will be to continuously manage the balance between the competing (and simultaneously complementary) notions that:

- information should be shared and
- information should be controlled
- in the best interests of society as a whole.

¹ *Shamans, Software and Spleens: Law and the Construction of the Information Society* by James Boyle (Harvard University Press, 1997); James Boyle, *The Second Enclosure Movement and the Construction of the Public Domain*, 66 *Law & Contemp. Probs.* 33 (2003), available at: <http://www.law.duke.edu/journals/lcp/articles/lcp66dWinterSpring2003p33.htm>.

See also *The Public Domain: enclosing the commons of the mind* by James Boyle (Yale University Press, 2008)

² If we take the birth of intellectual property as being the Statute of Anne in 1709/10, then the system has been around for about 300 years

³ See in particular *The Long Tail: How Endless Choice Is Creating Unlimited Demand* by Chris Anderson (Random House Business Books, 2006) for a comprehensive analysis of this potential and already visible trend.

⁴ Council Directive 93/98/EEC of 29 October 1993 harmonising the term of protection of copyright and certain related rights.

⁵ Jessica Litman, *Digital Copyright* (Prometheus Books, 2001), pp23, 25.

⁶ Council Directive 93/98/EEC of 29 October 1993 harmonising the term of protection of copyright and certain related rights.

⁷ Sometimes known as Serjeant Talfourd since he had been made a serjeant-at-law not long before becoming an MP. See http://en.wikipedia.org/wiki/Serjeant_Talfourd and <http://en.wikipedia.org/wiki/Serjeant-at-law>.

⁸ Copies of Macaulay’s speech are widely available on the Internet and I highly recommend reading it in its entirety. A couple of sources are Baen Books at <http://www.baen.com/library/palaver4.htm> and Kuro5hin at <http://www.kuro5hin.org/story/2002/4/25/1345/03329>.

⁹ Council Directive 91/250/EEC of 14 May 1991 on the legal protection of computer programs. Council Directive 92/100/EEC of 19 November 1992 on rental right and lending right and on certain rights related to copyright in the field of intellectual property. Council Directive 93/83/EEC of 27 September 1993 on the coordination of certain rules concerning copyright and rights related to copyright applicable to satellite broadcasting and cable retransmission. Council Directive 93/98/EEC of 29 October 1993 harmonising the term of protection of copyright and certain related rights.

Directive 96/9/EC of the European Parliament and of the Council of 11 March 1996 on the legal protection of databases

Directive 2001/29/EC of the European Parliament and of the Council of 22 May 2001 on the harmonisation of certain aspects of copyright and related rights in the information society.

Directive 2004/48/EC of the European Parliament and of the Council of 29 April 2004 on the enforcement of intellectual property rights.

The list goes on – the 2nd IPR enforcement directive, the extension of copyright term in sound recordings, the Telecoms package with the hidden facilitation of 3 strikes legislation etc.

¹⁰ Mark Twain once said “I never let my schooling interfere with my education”.

¹¹ *The Wealth of Networks* by Yochai Benkler (Yale University Press, 2006) is the definitive work on this process.

¹² I use the word ‘knowledge’ here not just in the sense of long-living structures of meaningful information but also to incorporate creative endeavours like inventions

¹³ Interestingly, Thailand's Supreme Court ruled in the summer of 2006 that whole works can be copied for free for educational purposes. <http://b2fxxx.blogspot.com/2006/07/free-copying-for-education-in-thailand.html>.

¹⁴ Campaigning group, Downhill Battle, organised a series of screenings of the film in 2005 to raise awareness of the problem.

¹⁵ The documentary was *Sing Faster*. Matt Groening, creator of the Simpsons, had told Else it would be ok but that he should just double check it with the Fox lawyers. Another documentary producer, making a film about education, noticed that in a classroom scene there was a TV running in the background and he had captured 2 seconds of the Simpsons. When he reached the Fox lawyers they wanted \$25,000 for permission to use the clip.

¹⁶ The Royal Dutch/Shell group's embarrassing admission at the beginning of 2004 that they had been knowingly publicly inflating their oil and gas reserves estimates was thought by some to be a significant indication that the oil industry recognises the reality of looming shortages. We just do not know precisely yet whether they are coming in 10, 50 or 100 years though the excellent *Hubbert's Peak: The Impending World Oil Shortage* (Princeton University Press, 2001) by Kenneth S. Deffeyes suggests that oil production will peak within the next ten years.

¹⁷ These figures come from a presentation *Joining the dots* given at the Energy Institute's *Oil Depletion: No Problem, Concern or Crisis* conference, on 10 November 2004 by Chris Skrebowski, editor of the UK journal, *Petroleum Review*.

¹⁸ A modern variation on Lord Justice Bowen's “man on the Clapham Omnibus” in the case of *McQuire v. Western Morning News* [1903] 2 KB 100, the hypothetical “reasonable man” in law.

¹⁹ *The Diversity of Life* by Edward O. Wilson (Penguin Books, 2001).

²⁰ This definition was offered in the UN Brundtland Commission Report on Sustainable Development: *World Commission on Environment and Development Report: Our Common Future*, 1987.

²¹ It is available online at http://www.adelphicharter.org/adelphi_charter_document.asp.

²² *The Diversity of Life* by Edward O. Wilson (Penguin Books, 2001, p306).