

Intellectual Property Games

Nancy Paterson

Abstract

Opening with a consideration of whether intellectual property rights are natural or contrived, this paper outlines the evolution of intellectual property rights and related policies and legislation, from a Canadian, from a US, and from a global perspective. This analysis situates the discussion of intellectual property within the context of game theory.

The role of new media technology vis-à-vis the global economy is described as the central theme of intellectual property games. In addition to tracing the evolution of copyright and patents as tools for managing and regulating intellectual property, this paper also addresses their potential to be applied, extended or modified to meet the needs and requirements of digital media products and processes.

In conclusion, details regarding several recent court challenges serve to highlight a number of important policy issues which relate specifically to interactive new media products.

Intellectual property rights are essentially intangible rights. Exploitation of information is the basis of the (often non-physical) object for which intellectual property rights exist. Such abstract ‘objects’ may be owned without a corresponding physical manifestation of the object being owned. Lawrence Lessig points out that it would be absurd to consider that concepts as fundamental and as universal as Einstein’s theory of relativity might be ‘owned.’ (p. 20) Distinguishing between discoveries and inventions/creations is the clearest means of determining when intellectual property rights may exist and when protection (legislation) may be applied.

In a recent landmark judgement, the Supreme Court of Canada ruled that works that are produced largely through ‘sweat’ but involve very little creativity – such as telephone books – do not enjoy copyright protection whereas “more complex works involving “skill and judgment that is not trivial” will enjoy such protection.”¹ (Makin) Similarly, while the discovery of a mathematical or scientific theorem is not considered a researcher’s personal intellectual property, a creative and unique application of that same theorem may be considered the intellectual property of the inventor or the institution for which s/he works. English vocabulary and grammar as well as musical notation do not fall within the realm of intellectual property – yet specific expressions utilizing one or the other of these systems were among the first creations to be designated as intellectual property and protected through the relatively recently established regimes of intellectual property legislation.

Intellectual property may be contrasted with the right and ability to ‘own’ and to buy or sell physical property/objects. The latter is a right which we consider to be integral to the foundation of our capitalist, consumerist culture. However, are either of these property rights also natural rights? Both physical and intellectual property rights are increasingly universally recognized, but mere familiarity or ‘recognition’ is an unsatisfactory means of determining whether something should be granted the status of a natural, human right. (Drahos: p. 20) In particular, current policies which have been established to recognize and to protect intellectual property rights, are designed to mandate that such rights exist for a limited period of time, or are subject to requirements of registration. Such limitations seem to argue for understanding intellectual property rights as contrived rather than natural rights.

If intellectual property law began with ‘protection’ as its primary motivation, it has evolved over time so that ‘ownership’ is now its central premise – whether or not that ownership confers a veritable monopoly (through a patent or a trademark). Is IP protection/ownership available for all created objects and processes? The broad and often haphazard application of patent law in the United States, provides several interesting

¹ In the same decision the Supreme Court of Canada ruled 9-0 that anyone making a single copy of material for research purposes in the field need not pay a licensing fee to its creator – a landmark victory for libraries and researchers in all fields. Interpreting copying by researchers as ‘fair dealing’, this ruling challenges the role of Access Copyright, The Canadian Copyright Licensing Agency, a not-for-profit agency established in 1988(as CanCopy) by publishers and creators to license public access to copyright works.

examples of the concept of 'ownership' gone awry. U.S. companies have applied for and been successful in receiving patents for tumeric (a spice) and for basmati rice. A patent awarded in 1986 for a plant which a pharmacology student brought back to the U.S. from Ecuador (Ayahuasca) led to charges of biopiracy and a legal battle between Amazon medicine men (who consider Ayahuasca a sacred plant) and International Plant Medicine Corp. (the holder of the patent).² David Downes, a lawyer in Washington representing the tribal leaders, pointed out that "When people claim as private property something that is sacred knowledge of thousands of people, we fear that patents have gone too far into the public domain."

Other recent applications of intellectual property rights have been equally controversial. In 1998, the Iceland parliament gave its agreement to an American company, DeCode Genetics, for the exploitation of the medical data, genealogical archives and DNA databank of Iceland's population (the population remained totally isolated for approximately 60 generations, up until the second world war – an excellent opportunity for the study of congenital disease). By contrast, in 1995, the Declaration of Indigenous Peoples of the Western Hemisphere Regarding the Human Genome Diversity Project was signed by nearly twenty indigenous peoples' advocacy groups from the U.S., Canada, Central and South America and one tribal government from the U.S. This declaration raised questions about patent law, intellectual property rights, commercialization of genetic materials and international trade. In 1997 at the North American Indigenous Peoples Summit on Biological Diversity and Biological Ethics, 'The Heart of the Peoples Declaration' opposed the concepts of intellectual property and the commodification of the 'natural world' that is reflected in patent law. (TallBear)

The World Intellectual Property Organization (WIPO) held a roundtable on Intellectual Property and Indigenous People in 1998, acknowledging the significance of many issues raised, primarily by Indigenous People. The report submitted by Mr. Antencio Lopez, opened:

Since the establishment of what we now know as the "intellectual property system" just over a century ago, indigenous knowledge, which is rich in medicine, art, crafts, music, literature, etc. has been steadily marginalized, simply because it has to do with the collective rights of a people and because it does not have a known author or creator.³

Most attempts to consider how cultural diversity and collective rights fit within IP regimes, have been relegated to the margins of Intellectual Property discussions; alternately, those issues which receive significant attention from both the lawmakers and the press, relate to revenues generated by entertainment or cultural products.

² The Tribal Council applied for and obtained a rejection of the Ayahuasca patent from the U.S. Patent and Trademark Office in 1999

³ http://www.wipo.int/documents/en/meetings/1998/indip/rt98_4b.htm

Joost Smiers is director of the Centre of Research of the Utrecht School of the Arts, the Netherlands, and visiting professor at the Department of World Arts and Cultures at the UCLA, Los Angeles. In the many papers on the subject of copyright reform which are available on his website (www.constantvzw.com/copy_cult/cjs0.html), Smiers points out that we are moving away from an economy which values physical property and objects, to an economy which understands the significance of intellectual content and resources. Public policy on an international, global scale as well as domestically, illuminates this transformation. “Intellectual content has become more important, and trade has reflected this change. Moreover, technology has become the driving engine of economic activity. At the core of technology are proprietary rights – copyrights, patents, trade secrets and trademarks.” Furthermore, Smiers questions the underlying priorities of intellectual property legislation in writing that “who tries to follow the debates on intellectual rights must get the impression that there is only one real issue which is spoiling the atmosphere of a booming and socially and culturally useful business. This is piracy.”

Considering intellectual property policies and legislation in a historical and global context, this paper will examine whether the standard tools of intellectual property regulation such as copyright and patent, may be applied, extended or modified to meet the needs and requirements of digital media products and processes. The consequences and outcomes of applying analog models of economic and business practice to digital media, and in particular, the problems inherent in the application of such tools to interactive new media products will be examined.

All property rights, whether pertaining to physical property or to intellectual property, whether natural or contrived, exist within a context which is simultaneously political, economic, and social. These rights are subject to legislation and policy decisions. “The emergence of well defined, secure property rights was a part of a much broader historical process in which absolute monarchies and their legitimating political philosophies lost their institutional dominance to be replaced by the institution of the modern state and secular political philosophies that recognized the rights of individuals within and against the state.” (Drahos: p. 23)

In a text which focuses on the implications of new media copyright extensions, M. Skala presents a compelling argument for intellectual property (specifically copyright) as a privilege created for policy reasons, rather than a natural right. (2001) This becomes the foundation of his assertion that “At this time large corporations claim that sweeping expansion of copyright is necessary to protect the supposed natural rights of authors. We claim that those natural rights do not exist, and also that expansion of copyright would harm Canadian policy goals.” (Skala: p. 1)

If intellectual property rights are not ‘natural’ rights, then they are dictated and controlled through the Constitutions of individual countries. In Canada, ‘freedom of expression’ is a central tenet of our Constitution (Section 2), whereas in the US protection of property is prioritized (Article 2), with freedom of speech protected only through the First Amendment to the Constitution. This difference in philosophy has

implications for a comparison of intellectual property legislation between these two countries.⁴ Skala contends that copyright laws are based on the idea of a legislated privilege created where no natural rights exist. He goes farther to say that copyright (in the US today) is perceived as “a protection for some natural right against the forces of evil embodied in new technology.” (Skala: p. 14)

In order to analyze the success of intellectual property policies as applied to digital media, we must determine the intent of the various decisions which are made, the legislation which results and the priorities which are represented. These can and will differ between nation-states, despite international organizations which have been formulated to serve ‘harmonizing’ global interests. The interplay between such opposing philosophies can be characterized as intellectual property games. As we weigh the benefits and disadvantages of specific policies regarding digital media, a broader perspective on this subject compels us to examine how various governments and corporations (particularly, as we shall see, those related to the United States), are interacting, negotiating and playing out their philosophies.

What psychologists call the theory of ‘social situations’, economists call game theory. Simply stated, game theory is the mathematical study of situations where ‘players’ strategize and make choices that affect the outcome of other players. Strategies are cumulative – together they add up to a final outcome. Something similar to game theory has been used to solve legal problems since ancient times. True game theory looks only at pragmatics, without taking into consideration questions of either ethics or morals. In true game theory, strategies are analyzed objectively; there is no place for subjective interpretations. The recent application of game theory to the field of economics peaked in the 1980’s losing some of its glamour when it was realized that it would be relatively easy to rationalize any form of behavior observed in markets by suggesting a game theoretical model whose equilibrium outcomes corresponded to what was observed. Nevertheless, game theory continues to be useful in many fields of economics, such as Industrial Organization, the branch of economics which deals with the interaction of firms in the marketplace. Developing a formula or program⁵ for predicting how people, companies and governments are likely to play their hands, has obvious implications for economics, global as well as local or domestic.

An important premise of Western capitalist society is that citizens are consistently rational and self-interested individuals, consistently pursuing their own interests. The Efficient Markets Hypothesis assumes that stock prices reflect a rational valuation based

⁴ Within the realm of intellectual property, ‘freedom of expression’ may have a variety of definitions. The ‘freedom’ of content producers to develop and distribute new media products is very different from the ‘freedom’ of consumers to have access to these products or even to participate in content production themselves.

⁵ John Nash proved the existence of a strategic equilibrium for non-cooperative games which was subsequently described as the ‘Nash Equilibrium.’ Using the principle of the Nash equilibrium (a set of strategies for each player) each ‘player’ has a strategy that is a ‘best response’ to the strategies of the other players. That is, each player makes the calculation: Suppose I know for sure that my opponents are going to follow a certain strategy. In that case, is my strategy the best choice I can make in response?

on all available information, and that as new information emerges, rational investors quickly adjust prices. Irrational behavior is thereby routinely eliminated (over time) as rational investors take advantage of systemic deviations and irrational investors are pushed out. As we have seen over the past decade, this is not always the case. We generalize and extrapolate patterns which may not reflect the true state of the market. Our decisions are based on past experiences of loss or gain. We have a myriad of prejudices and assumptions which prevent us from acting objectively and dispassionately when it comes to money and property, especially when it comes to *our* money and *our* property.

How can game theory be applied to discussions of intellectual property? If we consider this contest as largely economic, then on an international scale the players are governments as well as corporations (often multinational) which jockey for position, with support provided by policy consultants and the legal advisors. Although producers and consumers are described as central to this contest so far their requirements and expectations have played only a small part in IP games. The role of new media technology vis-à-vis the global economy is the central theme of IP games. Scenarios of outcomes may be forecast using game engines and high level visualizations, further extending the gaming metaphor.

An interesting recent example of the relationship between economics and game theory was the proposed futures exchange developed by the United States' Defense Advanced Research Projects Agency (DARPA). The Policy Analysis Market (PAM) was cancelled in July 2003 when Democrat Senators publicly criticized the concept as allowing trading in such events as coup d'états, assassinations and terrorist attacks. One of the models for PAM was a political futures market run by the University of Iowa (which has allegedly proven more accurate in predicting the outcomes of U.S. elections than either opinion polls or political pundits). Almost immediately after PAM began to be debated and criticized by the media, the Pentagon announced it was being cancelled; within a few days John Poindexter, head of the DARPA unit responsible for developing PAM, offered his resignation.

All this suggests that future multilateral treaty-making in intellectual property will be a complex game fought out by user and owner groups, groups whose membership transcends national boundaries. Library groups, educational institutions, internet service providers and developers of software applications are likely to unite to oppose large software companies and publishers of copyright reform. Indigenous peoples non-governmental organizations (NGO's) and environmental NGO's are likely to unite to fight the extension of the patent system to higher order life forms. Intellectual property policy has become a highly politicized arena in which state and non-state actors will continue to contest not just the rules of intellectual property, but also the roles of markets and government. (Drahos: 12)

A great deal of intellectual property policy analysis is generated by lawyers, copyright 'stakeholders' (i.e. publishers and broadcasters) professional policy consultants, academics, and lastly the affected group (or those who self-identify as

affected by these issues) including (more often) producers and (less often) consumers. Whether framed as ‘guides’ or as ‘critiques,’ few of these texts confront what an increasing number of cultural producers/consumers are beginning to realize is at the essence of the debate. Not the ‘how’ of doing it (developing intellectual property legislation), but the ‘why?’

With the emergence of digital media, including both the digitization of analog content and those digital media products which are conceived of specifically for production and distribution in digital form, the lid has been knocked firmly off of the Pandora’s Box otherwise known as intellectual property legislation. And while authors such as Lesley Ellen Harris publish books such as Canadian Copyright Law (3rd Edition) with ‘latest Canadian copyright law amendments included!’ ordinary Canadians, self-confessed ‘non-lawyers’ are tackling the truly difficult, philosophical questions about copyright and intellectual property. Not ‘How can you or I make money from copyright and digital media?’ but ‘What *was* the original spirit and philosophy of intellectual property in Canada, and how far have we strayed from that purpose?’ Also, ‘How are these principles manifested and reflected in current Canadian legislation, and how does Canada’s attitudes towards IP fit within a larger (international) context?’

Ordinary citizens, particularly young people (internationally as well as within Canada), are discussing and protesting the implications of intellectual property legislation. They are challenging and subverting copyright and patent laws which transcend borders, and which are increasingly being extended into realms where the protection afforded by such legislation seems questionable (genetics and computer software) and possibly counter-productive towards the encouragement of creativity and innovation. The US originally advocated for copyright protection of computer software; currently they are promoting software patents. This move is encountering significant resistance in Europe, where a number of protests against software patents have taken place recently.⁶ Software which is considered patentable tends to represent a ‘technical effect,’ for example, software which controls a manufacturing process is patentable while software designed to search a database is not. In the European Committee, the national laws with regards to patents derive from the European Patent Convention. The European Committee Software Directive (June 1993) accorded copyright protection to computer programs, equating them to literary works within the meaning of Berne (although reverse engineering is permitted under strict criteria and guidelines). The European Patent Office (EPO) grants patents to the contracting states to the EPC, which was signed in 1973 in Munich, and came into force in 1977.

In North America we are all stakeholders in all aspects of intellectual property, and not merely by virtue of extending the definition of intellectual property to include all data which is or which could exist in a digital form. (Harris 1998: p. 9) Rather, whether as developers, distributors, users or consumers, we all have a great deal to gain (or lose)

⁶ In addition to a demonstration in Brussels on Aug. 27, 2003, a corresponding international online protest was organized by the Foundation for a Free Information Infrastructure FFII, a non-profit association registered in Munich.

by the framework which we develop or support as a means to encourage and protect digital innovation. For example, while it is true that the US dominates the English-speaking commercial film industry, it is computer graphics creation software from Canada which is primarily used in these productions.

Public policy is dynamic and constantly evolving, and this is nowhere more evident than in the convergence of digital media and intellectual property. We are presented not only with the challenge of understanding the framework which we have inherited, but with the necessity of adapting or reframing it for an economy and a society which is growing to depend on digital products and processes. Previously the economy drove technology; today technology drives the economy. The stakes are high in intellectual property games.

In Canada, intellectual property is comprised of six legal regimes which, to differing degrees, confer right of ownership in a particular subject matter: copyright, patent, trademarks, industrial design, trade secrets and (since 1990) integrated circuit topography. Two of these, however, are currently dominating the world stage – they are the focus of both international treaties and international protests: copyright and patent. As the focus of this paper is digital (new) media, particularly those products and processes which may be characterized as interactive, this discussion of IP (intellectual property) will focus on copyright and patent as being the legal regimes in which these products and processes are most likely to occur. To a lesser extent integrated circuit protection will also be discussed.

In addition to tracing the evolution of copyright and patents as tools for managing and regulating intellectual property, I am also interested in addressing their potential to be applied, extended or modified to meet the needs and requirements of digital media products and processes. In so doing, I consider not only the concerns of producers/developers and certainly not only the interests of publishers/distributors, but also the needs and expectations of those who are most often overlooked in this relationship: the consumers of new media – the end user.

An understanding of the current framework regarding IP in Canada must be situated within an historical and global perspective. In the spirit of Laura J. Murray, whose website about copyright in Canada is titled ‘An Introduction and Incitement,’ this text will delve more deeply into the logic, rationale and justifications of copyright and patents and the larger field of intellectual property.

As an example of how integral the issues of controlling intellectual property have become to daily life in North America, it would be difficult to find many without an opinion regarding the tug-of-war over digital products and processes which ensued between media consumers, content producers and media service providers, at the turn of the 21st century. Newspapers are packed with stories about hackers and phreaks subverting recently established modes of distribution – telecommunications and computer networks alike. Similarly, open-source and file-sharing as an alternative to ‘buying in’ to commercial models is alternately lauded or described in the most negative possible terms.

Microsoft terms any use of the internet not mediated through their products as ‘The Darknet’ in a commissioned report titled ‘The Darknet and the Future of Content Distribution’ describing the evils of P2P (peer-to-peer) exchange of data, CD and DVD copying and key or password sharing. (Biddle 2002) In the predictably sensational media coverage, the regulatory mood may be characterized by two words: greed and fear, and by the question ‘Who shall we blame?’ In fact, while the pendulum swings wildly between consumers and producers it is becoming clear that when it finally comes to rest the pendulum will point to those who stand to lose the most from genuine copyright and intellectual property legislation reform. It will point to those who incite the content producers to mistrust the audience, to assume the worst of them and, above all other motivations, to demand that they be valued in cash (ostensibly because only tighter copyright laws will help artists, writers and musicians make a decent living). It will point to those who tell consumers that the only idea and the only product worth having is the one that is paid for, that culture is not a means of expression, it is a ‘cash-grab’, and that ordinary uses of cultural materials are ‘piracy’ In the short run, the blame will lie with the distributors and media product/service providers. Where will the blame lie in the long run?

The history of Canada’s participation in the protection and regulation of intellectual property has been brief for obvious reasons, yet the United States, a country not much more established, presents an interesting contrast to Canada in this respect. Its intellectual property legislation was similarly reactive until the 1940’s; however, after World War II (particularly since 1944 – Bretton Woods Conference), US public policy governing intellectual property has been proactive. Protection and regulation of digital assets has been accurately targeted as the foundation of IP; as well, these policy issues may be described as the foundation of evolving global economies in the 21st century. US policy makers have recently advanced a very focused and aggressive agenda both nationally and internationally to assert US hegemony and the profitability of (US-centric) media conglomerates.

There are several reasons that it is essential to consider Canada’s position within the context of a larger world view, not least of which is the fact that WIPO (the World Intellectual Property Organization) is supporting the expansionary nature of intellectual property, both in scope and in domain. “The twentieth century has seen new or existing subject matter added to present intellectual property systems (for example, the protection of computer software as part of copyright, the patentability of micro-organisms as part of patent law), and new systems created to protect existing or new subject matter (for example, plant variety protection and circuit layouts).” (Drahos: p. 1) The expansionary nature of intellectual property, is also clearly demonstrated by the parallel trajectories of WIPO and WTO and the role of the US in channeling their priorities through these bodies.

The protection of intellectual property at an international level can roughly be divided into three periods. The first period, the territorial period, is essentially characterized by an absence of international protection. The second, the international period, begins in Europe towards the end of the 19th century with

some countries agreeing to the formation of the Paris Convention for the Protection of Industrial property, 1883 (the Paris Convention) and a similar group agreeing to the Berne Convention for the Protection of Literary and Artistic Works, 1886 (the Berne Convention). The third period, the global period, has its origins in the linkage that the United States of America (the U.S.A.) made between trade and intellectual property in the 1980's, a linkage which emerged at a multilateral level in the form of the Agreement on Trade-Related Aspects of Intellectual Property Rights, 1994 (the TRIPS Agreement). (Drahos: p. 3)

The root of intellectual property laws may perhaps be traced back to the system of royal privilege-giving which operated in most of medieval Europe. The Venetians are credited with the first properly developed patent law in 1474. In the following decades, England (1623) and France (1791) recognized through law the rights of inventors. In the US, basic patent law was first established in 1790. In the first half of the nineteenth century, patent law began to spread throughout Europe. A similar pattern can be seen with copyright legislation, which began in England with the Statute of Anne in 1709. This 'territorial' period was dominated by the idea that intellectual property rights apply only within the territory of the sovereign which has granted the rights.

During the 19th century the possibility of international co-operation on intellectual property was explored through various bilateral agreements which were grounded in a strategy of reciprocity. These agreements were generally pursued within European states and were intended to address the concerns of authors and publishers whose works were being reproduced abroad without consideration in the form of royalties or other recompense. Bilateral agreements extended beyond copyright, however, to address trade marks and other forms of intellectual property. Interestingly, although America was not the sole culprit in the republishing of works by authors such as Dickens, they were responsible for a considerable amount of this 'piracy.' At the same time, the US Copyright Act of 1790 was a form of national protectionism which granted copyright protection only to citizens and residents of the US. The US began to exercise leadership in international copyright only after World War II. However, it would be 1989 before the US joined the Berne Convention, perhaps reflecting their reticence to accept responsibility for their own earlier transgressions.

Bilateralism in intellectual property protection was a prelude to the Paris Convention of 1883 and the Berne Convention of 1886. World fairs, like the trade fairs of medieval Europe, were important venues at which new inventions could be introduced. Discussions prior to the Vienna Worlds Fair of 1873 articulated a growing concern that there was no system of protection in place to alleviate the concerns of participating inventors that their new products and processes would not be appropriated. These discussions culminated in the Paris Convention which would protect inventors, a particular boon for those participating in such events. Within 25 years of being opened for signature in 1883, a majority of trading nations had joined the Convention. The Berne convention of 1886 was a direct result of discussions by the International Literary Association, an association of authors who felt that, in order to be truly effective, the

protection afforded to them by bilateral agreements must be enshrined in international legislation.

In addition to numerous revisions of the Paris and Berne Conventions over the course of the twentieth century, additional international intellectual property regimes came into existence including agreements to protect trademarks, designs, performance, plant varieties, patents, and semiconductor chip designs. The Paris and Berne Conventions led to the formation of the United International Bureaux for the Protection of Intellectual Property in 1893, and BIRPI was superseded by WIPO in 1967. In 1974, WIPO became a specialized agency of the United Nations.

In July 1944, the Bretton Woods Conference set up the World Bank, GATT (General Agreement on Tariffs and Trade) and the IMF (International Monetary Fund). The institutions and economic policies created at Bretton Woods (such as the US dollar pegged to gold and all other currencies pegged to the US dollar), followed by the collapse of Bretton Woods in 1971 (where the US dollar began to free-float), set the stage for the nation-state challenges facing all global citizens at the opening of the 21st century.⁷

By World War II most developed nations had already signed both the Berne and Paris Conventions, so that following World War II, membership in these conventions expanded to include more and more developing countries. Governed by the principle of one-vote-one-state, this led first to the possibility of Western nations being outvoted by a coalition of developing countries. More significantly, however, this subsequently led to a shift in priorities, as developing countries demanded an international system that took into account their stage of economic development. For example, led by India, in 1967, the Stockholm Protocol was adopted, giving developing countries greater access to copyright materials. Developing countries also pushed for more liberal provisions on compulsory licensing.

This tension between developing and developed nations reached a critical point over the issue of pharmaceuticals. In India, patent laws covered processes relating to the production of pharmaceuticals but not the chemical compounds themselves. Based on this philosophy, and in an effort to lower drug prices (in the 1960's India had experienced some of the highest drug prices in the world) India sought to reform the Paris Convention to give developing countries access to technology that was locked up due to patents. While 'free-riding' was tolerated during the international period of intellectual property, that period was about to end, as the US moved to link intellectual property to trade, ushering in the global period. This effort was spearheaded by US-based pharmaceutical companies who demanded that their intellectual property be protected regardless of where their production facilities were located. This was accomplished by the US through the reshaping of their trade laws during the 1980's, to incorporate bilateral enforcement

⁷ By 1971 the \$US was no longer convertible to gold and any attempts to fix many currencies' exchange rates were abandoned in 1973 in favour of floating exchange rates. Some exceptions include China which is currently pegged to the US dollar and the 5 Arab nations: Qatar, Dubai, UAE, Kuwait and Saudi Arabia, which have all pledged to develop a common currency by 2005 which will be pegged to the US dollar.

strategies against countries it considered had inadequate levels of intellectual property enforcement. The Office of the United States Trade Representative was charged with the task of identifying problem countries and entering into negotiations with those countries to remedy the problems. Should this not produce the desired results, the next step would be trade sanctions.

In a 1986 meeting which launched the Uruguay Round of trade talks at GATT, intellectual property was introduced as a negotiating issue by the US, with the backing of Europe, Canada and Japan. In the late 1980's the US utilized their position within WIPO to persuade the international community to use copyright law as the principal form of legal protection for computer programs. (Samuelson: p. 5) This remained a priority for the US until it was successfully incorporated into TRIPS (the Agreement on Trade-Related Aspects of Intellectual Property Rights). In 1994 the Uruguay Round concluded and more than 100 countries signed the Final Act. "It contained a number of agreements including the Agreement Establishing the World Trade Organization and the TRIPS Agreement. The TRIPS Agreement was made binding on all members of the World Trade Organization (WTO). There was no way for a state that wished to become or remain a member of the multilateral trading regime to side-step the TRIPS agreement." (Drahos: p. 10) Game theory is easily applied to economics (trade), and intellectual property regulation may be used as a tool for achieving particular economic goals. If bilateral agreements were the beginning of intellectual property games being played, TRIPS represented the beginning of intellectual property games being played for keeps.

The TRIPS agreement represents the beginning of intellectual property globalization. Intellectual property played a large part in the regional arrangements of the 1990's, such as NAFTA which contains extension provisions on intellectual property. Pre-TRIPS, the intellectual property framework had left individual states with the option to not ratify certain protocols or conventions, or to incorporate reservations on clauses in treaties. However, as of 1994, all of the TRIPS Agreement is binding on members of the WTO. A common expanded set of intellectual property standards is mandatory and there is less flexibility for individual member countries; for example, states have less discretion to determine what can and cannot be patentable.

In 1993 the Information Infrastructure Task Force (IITF) was established in the US in order to implement the National Information Infrastructure. In 1996 the Clinton Administration undertook to present their digital agenda to both the US Senate and at the WIPO diplomatic conference in Geneva.

In particular, Clinton Administration officials sought approval in Geneva for international norms that would have (1) granted copyright owners exclusive rights to control virtually all temporary reproductions of protected works in the random access memory of computers; (2) treated digital transmissions of protected works as distributions of copies to the public; (3) curtailed the power of nations to adopt exceptions and limitations on the exclusive rights of copyright owners, including fair use and first sale privileges; (4) enabled copyright owners to challenge the manufacture and sale of technologies or services capable of circumventing

technological protection for copyrighted works; (5) protected the integrity of rights management information attached to protected works in digital form; and (6) created a sui generis form of legal protection for the contents of databases. (Samuelson: p. 2)

Was the US Digital Agenda at WIPO a success? Clearly not. The conference rejected the temporary copying proposals, decided to treat digital transmissions as communications to the public rather than as distributions of copies, preserved existing user privileges in national laws, rejected outright the anti-circumvention provision which the US had promoted, and accepted only a watered-down version of rights management. Furthermore the database treaty proposed by the US was found to be so objectionable that it was dropped with little discussion. (Samuelson: p. 20)

However, two treaties did emerge from Geneva: the WIPO Performance and Phonograms Treaty (WPPT) and the WIPO Copyright Treaty (WCT), commonly referred to as the WIPO Internet Treaties. These treaties were introduced post-TRIPS and entered into force in 2002 after receiving thirty ratifications. Canada became a signatory of the two treaties in 1997, demonstrating Canada's commitment to the principles they represent. Canada, however, was not one of the thirty countries which ratified either treaty. In this matter, as in previous treaty ratifications, Michael Geist (Research Chair in Internet and E-Commerce Law at the University of Ottawa) is of the opinion that a cautious approach is often advisable. "Rather than leaping toward ill-conceived copyright reform that would harm innovation and the Canadian public, our go-slow approach has enabled policy makers to view the mistakes of others, (notably the United States), and work toward crafting a Canadian policy that better reflects the national interest." (Geist: p. 1)

The success of the US digital initiative as demonstrated by the incorporation of WCT and WPPT at WIPO, led to discussions in US Congress about updating domestic copyright law, and as a result the Digital Millennium Copyright Act was signed into law in 1998. The stated purpose of this law was to institute the WCT and WPPT; however it was also extended to address other copyright issues relating to digital media. In particular, the DMCA makes it illegal to deal with 'circumvention devices' that give access to a copyrighted work. Secondly, ISP's are given a 'safe harbour' from copyright liability and litigation for hosting copyrighted files as long as they remove them quickly once 'notified'.⁸ The DMCA also requires ISP's to hand over information about subscribers to copyright holders upon request.

IP legislation is directly linked to economic and political influences which any analysis must take into consideration – both domestically and internationally. For example, the venture-capital arm of the CIA is currently funding the CIA/In-Q-Tel Interface Centre. Undertaken in 1999 as a five-year experiment, it has been so successful that the CIA has asked Congress to approve an extension of their charter. In-Q-Tel "invests about \$35 million a year in young companies creating technology that might

⁸ The 'notice and take down' clause of the DMCA fulfills this function.

improve the ability of the United States to spy on its nemeses.” (Maney). From their website: “Our mission is to deliver leading-edge technologies to the CIA and the Intelligence Community. We’re a critical link between the Agency’s users and the most promising technologies in the marketplace.”⁹

What role has Canada played and how has Canada been affected by intellectual property legislation at an international level? Prior to 1924 when the Canadian Copyright Act came into force, only British produced materials were covered by Imperial copyright legislation. Within a few years (1928) Canada also became a signatory on the Berne Convention. Less than half a century later, in 1970 Canada became a member of the World Intellectual Property Organization (WIPO), the specialized United Nations body whose primary role was to administer copyright treaties which were considered key to the stimulation and protection of cultural work. As mentioned, at the 1986 meeting which launched the Uruguay Round of trade talks, the US introduced intellectual property as a negotiating issue with the backing of Europe, Canada and Japan. And in 1988 the Canadian federal government ratified the Canada-US Free Trade agreement. While this agreement gave Canada the right to exempt its cultural products from the agreement, it also granted the US the right to use ‘measures of equal effect’ against other trade sectors if they were harmed by Canadian actions, to protect their cultural industries.

A flurry of activity related to Canada’s Copyright Act and digital intellectual property took place in the 1980’s and early 1990’s. In 1985 ‘A Charter of Rights for Creators: Report of the Sub-Committee on the Revision of Copyright’ was published by the Standing Committee on Communications and Culture, Gabriel Fontaine Chairman. In 1988 the Federal Government ratified the Canada-US Free Trade Agreement. As well, the Copyright Act amended to include computer programs and Access Copyright, The Canadian Copyright Licensing Agency, a not-for-profit agency was established (as Cancopy) by publishers and creators to license public access to copyright works. In 1989 the Copyright Act was further amended to comply with 1988 Free Trade Agreement (e.g. cable and satellite companies now required to pay for the re-transmission of works included in distant broadcast signals – e.g. US originated programming). Subsequently, internet bitcasters such as icrave and JumpTV who sought to re-transmit US and Canadian TV signals have been blocked from doing so. And in 1993, Bill C-88 to amend the Copyright Act was passed (all transmitters, including broadcasters and cable companies now liable for royalties to producers) In 1994 Canada also ratified the Uruguay Round of negotiations on the General Agreement on Tariffs and Trade (GATT) and became a member of the new World Trade Organization (WTO) which the agreement created. This agreement stipulated that Canada’s cultural services are exempted and establishes at the WTO an international dispute resolution for copyright issues.

⁹ <http://www.in-q-tel.com>. In another recent news item, the NSA (National Security Agency), the largest and most secretive of U.S. spy bureaus, has contracted with a Canadian Company, Certicom, to develop ECC (elliptic curve encryption)

It is interesting to note the outcome of the first major dispute to be addressed by the WTO concerning Canada – the amendment of the Excise Tax Act at the recommendation of the 1994 Task Force on the Canadian Magazine Industry. In 1995 Canada had imposed an 80 percent excise tax on advertising in split-run magazines. Split-run magazines are periodicals sold both in Canada and abroad, in which the Canadian edition contains advertisements directed at a Canadian audience. The tax was designed to prevent Time-Warner from publishing in Canada a local edition of Sports Illustrated and to prevent future entries by split-run magazines into the Canadian market. The US government challenged discriminatory practices by the government of Canada that unfairly protect Canada's domestic magazine industry. In 1997 WIPO ruled that Canada's use of its excise law was in violation of GATT rules; Canada appealed and subsequently lost this appeal. The WTO panel also overturned an earlier ruling that Canada's use of postal subsidies for periodicals was justified and gave Canada six months to comply with the ruling.

Domestically, the Canadian Government had addressed the need to further investigate the challenges of the emerging digitally networked environment in December 1994, by establishing IHAC (Information Highway Advisory Council). IHAC's largely ineffectual final report was issued in 1995. Recommendation 6.2 stated that "the current categories of works contained in the Copyright Act sufficiently identify works produced and used in a digital environment and should not be amended or eliminated."¹⁰ Also, in 1999 the CRTC released its Report on New Media which stated that the CRTC would not attempt to regulate the Internet, leaving 'Canadian Internet Presence' and 'Canadian Product' to market forces.

What are Canada's priorities regarding IP and digital media? 'As described on the Connecting Canadians website¹¹ one of the government's key priorities, as part of this agenda, is to help Canada "become a world leader in supplying on-line content as well as exciting new software and applications." In 1999 Ottawa launched the Government On-Line (GOL) initiative, promising to deliver a wide range of public services online in a secure and convenient way by 2005. The funding needed to follow-through with these priorities, however, has not materialized. Furthermore, if the Canadian government is committed to facilitating and promoting new media innovation by its citizens internationally, there is some debate as to whether this will be best done by following the US lead in legislation or continuing to hold the 'last adopter' stance. To what extent is government intervention assistive, to either the content producer or end-user, in such a rapidly changing technological environment?

There have been a number of highly politicized disagreements between Canada and the US regarding digital technologies and music, specifically file-sharing. On December 12, 2003 the Copyright Board of Canada handed down a very significant

¹⁰ Intellectual Property Policy Directorate, Industry Canada 'Consultation Paper on Digital Copyright Issues.'

¹¹ <http://www.connect.gc.ca>

decision on the controversial topic of the legality of downloading and uploading music from the Internet in Canada. In its decision, the Board noted that “the Copyright Act expressly permits the copying of music for private use, and that the levies paid by Canadians on audio recording media already compensates artists for this right. The Board went on to state that the source of the copied material is irrelevant – it is legal to copy music for private use ‘whether the source of the track is a pre-owned recording, a borrowed CD, or a track downloaded from the Internet.’ However, the Board also held that there is no similar right to upload music or share files online and that these activities are still prohibited by the Canadian Copyright Act.”¹² While the Digital Millennium Copyright Act makes it illegal to share copyright material in the US, the Canadian Copyright Act allows the same copying (which is the foundation of peer-to-peer file sharing). The system of Private Copying is administered in Canada by the Canadian Private Copying Collective (CPCC) on behalf of artists’ associations such as SOCAN (Society of Composers, Authors and Music Publishers of Canada). Also in December 2003, the blank media levy in Canada was expanded from CD’s and analog audiocassettes to include mp3 players. However, recordable and re-writeable DVD’s, removable micro hard drives and removable memory cards are not considered taxable items as, in the Board’s view “the evidence available at this time does not clearly demonstrate that these recording media are ordinarily used by individuals for the purpose of copying music.”

On March 31, 2004, federal Justice Konrad von Finckenstein denied a request made by CRIA (Canadian Recording Industry Association) for a court order that would require five Internet service providers to disclose the names of 29 ‘John/Jane Does’ accused of copyright infringement. This federal court ruling not only reinforces the downloading right, but states that making songs available for sharing over the Internet is not illegal under Canadian copyright law because the user isn’t actively distributing music or advertising its availability. The status of those who share music files (as opposed to other types of files, such as movies) is very much the focus of current legislation, in both Canada and the US.

The formulation and implementation of the Digital Millennium Copyright Act (DMCA) to date provides some clues as to the priorities of the US government and the corporations (primarily entertainment-based) which have influenced this legislation. The Church of Scientology was one of the first organizations to make use of the DMCA when, in 1999, they forced AT&T Worldnet to reveal the identity of an individual who had been posting anonymously to alt.religion.scientology. In July 2001, perhaps the most well known implementation of DMCA led to the arrest of a visiting Russian engineer/academic attending a conference in the US. Dmitry Sklyarov was in Las Vegas for the purpose of presenting his research on the subject of digital rights management technologies – specifically Adobe’s eBook system. Following his presentation, Sklyarov was arrested by the FBI and imprisoned for approximately 3 weeks without bail. Elcomsoft (Sklyarov’s employer) was subsequently charged with ‘trafficking in a circumvention device’ for sales of the Advanced eBook Processor software. Prior to this

¹² Smart & Biggar website: <http://www.smart-biggar.ca/Publications/>

case, Matthew Skala (a Canadian graduate student) and a colleague in Sweden collaborated in writing a review of a censorware package called CyberPatrol. They applied the techniques of ‘reverse engineering’ to examine how the software worked and ‘cryptanalysis’ (mathematical code-breaking) to decode the embedded blacklist of websites. Posting an essay describing the procedure used for analyzing Cyber Patrol and what was found, they also wrote and made available software (‘cphack’) which could be used to display for the user the list of blocked websites. They were sued by Microsystems Software and Mattel (the vendors of Cyber Patrol) in U.S. Federal court even though Skala resided in Canada, and Jansson in Sweden. An out-of-court settlement was eventually negotiated. These cases are alarming for a number of reasons – not least of which is the apparent success with which the US is able to apply their laws to individuals who are not US citizens, for activities carried out, outside of the US.

As has been aptly demonstrated, primarily by the Open Source community¹³ and movement, policy and law makers today find themselves in a position of playing catch-up to new media. Individuals are empowered with technology, and take every available opportunity (and many opportunities which they manufacture for themselves) to adapt technology for their own purposes. Often this is done without regard for the original purpose of the technology. Also occasionally, it is done to intentionally subvert the original inventor/developer’s intent. Policy makers generally meet such creativity, innovation and experimentation with laws restricting such activities by individuals who seem to be stepping beyond the boundaries of their roles as ‘consumer’ or ‘end-user’. In turn, these laws are often perceived by the general public as gratuitous expressions of power and control.

New media products which are designed to require a user’s input raises interesting and important questions of shared authorship and multiple authorship. To producers following traditional business practices, the empowerment of the end-user is seen as a liability; the prospect of end users as producers or co-producers is discouraged by telecom designs which are asymmetrical.¹⁴ Imitating a TV-based ‘push’ media model, ‘interaction’ is promoted as one-sided. Users are encouraged to download with uploading strictly limited to shopping or selecting content to be viewed or otherwise used. Yet nearly half of US Internet users have contributed online content in the form of applications such as websites, blogs and file-sharing.¹⁵ Similar restrictions such as discouraging customers from hosting their own servers via cable modems or (A)DSL

¹³ The Open Source Initiative, The Free Software Foundation, and The Electronic Frontier Foundation are all examples of organizations committed (to varying degrees) to the promotion of the open source model. What sets open source software apart from commercial software is the fact that the source code is freely available, in both the political and the economic sense. A culture has evolved around the open source development model. Open source products often are developed and supported by a community of people, often volunteers. Users of open source products tend to work together, sharing knowledge and solving problems.

¹⁴ ADSL = asymmetrical digital subscriber line

¹⁵ Reuters report on the Pew Internet and American Life Project found that about 44% of the country’s Internet users have created content for others to enjoy online.

purposefully thwarts end-users who aspire to push out their own content. Restricting the end-user's ability to upload or host (usually Apache servers) or file share ('personal websharing', 'peer-to-peer', etc.) is a position which Canadian policy does not address. In fact, such restrictions are being incorporated into the backbone bandwidth pipeline; called QOS (Quality of Service). In this model different types of content are distinguished between, essentially resulting in preferential treatment for some services and users.

Evidence of long term lack of clear policy regarding intellectual property by the federal government became particularly evident through the transition from Prime Minister Chretien to Prime Minister Martin. Bill C-20, which proposed changes to Canada's child pornography law, specifically eliminating 'artistic merit' as a defence, had been first introduced in 2003. It died on the order bill, however, when Chretien prorogued the House in November 2003. It was reintroduced in February 2004 as Bill C-12 and went through 1st and 2nd readings and committee reports, in the course of one day. Bill C-9, the new Access to Medicines Patent and Intellectual Property Rights Act similarly was rushed through two readings in one day. Can we expect the same approach with the ratification of the two outstanding WIPO treaties (WCT and WPPT)?

IP legislation professes to prioritize the needs of digital content producers; as we have seen, within the context of IP games, these needs are often forgotten. In Canada, at least, collective rights management may be available to creative individuals through Status of the Artist legislation¹⁶ as it establishes a framework for the conduct of professional relations between independent professional artists and producers, as well as guaranteeing their right to join associations that can represent their professional interests and the right to bargain collectively with producers. The problem with this, however, is that most artists and creative producers usually don't band together unless they're working in an industry that's in its sunset years, and this does not include artists and creators working in the field of new media.

Policy issues which affect end-users encompass more than questions of legality and prosecution. The issue of downloading vs. uploading raises questions about the structure of the internet itself and IP address assignment (static vs. dynamic). Currently the internet employs a standard known as IPV4; however, with the proliferation of personal web servers and end-users desiring to provide content, the system of assigning dynamic IP addresses as needed, is clearly inefficient. A transition to IPV6 would provide for more IP addresses, certainly enough to assign each user more than their own (permanent) IP address. This is clearly in the interest of the end-users, but how do the producers/distributors feel about this prospect? Although Microsoft and other similar companies profess to be behind the transition to IPV6, and although the actual software/hardware change-over would require only minimal disruption on the Internet, it is becoming obvious that this will not happen without an organized initiative through an international body. Such a move would usher in a new era and spirit of cooperation, further opening up the possibility of discussing other important issues with global implications, such as the expansion of major peering points beyond the US borders, to

¹⁶ Established 1992

countries including Canada, South America, Russia, Africa, etc. This, in turn, would facilitate further discussions about the politics of bandwidth. Just as the opening up of Global Positioning Systems (GPS)¹⁷ enabled many new businesses to emerge, the introduction of IPV6 would similarly provide a boost to economic growth.

A refusal, on the part of governments, policy makers and corporations to envision a future in which new media interactivity is key, is an attempt to avoid the inevitable while clinging to outdated analog business practices. Intellectual property games to date have focused on prohibitive legislation which attempts to restrict the end-user from breaking free of the model of passive consumption. Yet, we are in a transition from passive to more interactive media. In North America, the current technology-based economy shake-out has seen many jobs disappear, either replaced by technology, outsourced or off-shored. Semiconductor plants are replacing auto-plants as a base of power.¹⁸

Increasingly, people are questioning the protection and challenging the economic preservation of those 'stars' of the passive content model: the actors, musicians and sports figures, etc., reasoning that they too should 'suffer' this economic shake-out. The protection of the content distributors is being challenged and (perhaps predictably) in an interesting application of Schumpeter's Creative Destruction, a new economy with new models for wealth and success is emerging – a corporate environment dominated, as Schumpeter would have predicted, by monopolies.

In describing the difficulties of shaping policy intended to simultaneously protect and facilitate cultural production, Smiers links diversity and globalization. "One of the difficulties originates from the fact that there is no worldwide shared vision on how to regulate globalization, let alone how to prioritize cultural diversity." (p. 39 'Artistic Expression in a Corporate World') If Intellectual Property rights are contrived rather than natural rights, then it is not unreasonable to expect that they will change to reflect changing cultural attitudes. To date, these changes have been largely in the direction of expanding IP rights to 'protect' the ownership of producers and distributors; however, as we have seen with the case of uploading/downloading music in Canada, IP legislation can also be interpreted to protect the rights of consumers. Prioritizing diversity may be the next cause which consumers embrace as they realize the importance of this issue. And the influence of consumers should not be underestimated.

¹⁷ Originally conceived in the 1970s, GPS was a military-only technology until the early 1980s, when President Reagan, following the Soviet shoot-down of a South Korean airliner that had lost its way, decided the technology could be adapted for public use. In order to avoid having the technology used in a military attack on the U.S., the military deliberately distorted the signal to keep civilian gear from being more accurate. This was called "selective availability," or "SA" for short. On May 1, 2000, President Clinton signed an order ending SA and making civilian GPS readers a lot more accurate.

RFID (Radio Frequency Identification) technology is (global) wireless technology that facilitates supply-chain management. Both GPS and RFID adoption are examples that point towards the inevitable implementation of IPV6 for both wired and wireless networks.

¹⁸ Microchip fabrication plants (chipfabs) are highly automated.

Although Smiers focuses on cultural diversity, many would argue that diversity in science and in communications technologies, are equally important – and there is no reason that IP cannot be interpreted to promote them all. Certainly, the realization that we have come to rely in the food chain primarily on only one strain of banana (which may be extinct within ten years) and on only six strains of chicken (currently being threatened by avian flu) has brought the value of diversity to the attention of many consumers. The example of the transition from IPV4 to IPV6 alone would encourage diversity in the area of communications technologies – ideally before the MAI (Multilateral Agreement on Investments) is resurrected.

In the final few pages of ‘Artistic Expression in a Corporate World,’ Smiers finally discusses new media technologies. Because the policies which need to be enacted in order to deal with new media must be innovative, there is no place for historians and policymakers with limited experience in the field. Throughout his text, in failing to define culture vs. cultural products, it is not clear exactly what Smiers aims to protect. Smiers does realize, however, that the stakes are high, writing that “care should be taken that the cultural field in this newly digitized world does not become a playground for the cultural conglomerates only.” (Smiers: p. 69)

Primarily because all hardware is software (only it runs faster), circuit board topography has been recognized as an additional important consideration in IP legislation. In the digital economy distinguishing between hardware and software becomes problematic but also less important. What becomes more important is the infrastructure which is used to distribute and share access to data, information and applications. The transformation from an analog to a digital economy has eclipsed IP legislation. Media conglomerates (also known as CET’s: mergers representing communications, entertainment and telecom) will share the responsibility for upgrading the delivery systems, whether hard-wired networks or wireless. Market forces such as falling profit margins (due to bootlegging and file sharing, etc.) will force them to enable and facilitate the interactivity which is required. Emerging rights, vis-à-vis emerging technologies, will govern the hand being dealt next to the players in intellectual property games.

References

- Biddle, Peter, et. al. (2002) 'The Darknet and the Future of Content Distribution' [Online] Available: <http://crypto.stanford.edu/DRM2002/darknet5.doc>
- Canadian Heritage. (2004) 'Copyright Revision' [Online] Available: http://strategis.ic.gc.ca/epic/internet/inippd=dppl.nsf/vwGeneratedInterE/h_ip00008e.html
- Canadian Heritage (2004) 'What's New: Copyright Policy Branch' [Online] Available: http://www.pch.gc.ca/progs/ac-ca/progs/pda-cpb/legislation/hist_e.cfm
- Constitutional Law of Canada (2004) [Online] Available: <http://www.constitutional-law.net/expression.html>
- Currie, Jay. (2003) 'Blame Canada' [Online] Available: <http://techcentralstation.com/081803C.html>
- Drahos, Peter. (1998). 'The Universality of Intellectual Property Rights: Origins and Development.' [Online] Available: <http://www.wipo.org/tk/en/activities/1998/humanrights/papers/word/drahos.doc>
- Gahtan, Alan. (2001) 'Canadian Copyright Reform' [Online] Available: <http://www.gahtan.com/alan/articles/200107%20Copyright%20Law.htm>
- Geist, Michael (2003) 'Will Copyright Treaty Benefit Canadians?' [Online] Available: <http://lists.essential.org/pipermail/e-commerce2003q4/001120.html>
- Hamilton, Tyler (2004) 'Groups to Intervene in Music Case' Toronto Star, March 2, 2004.
- Hamilton, Tyler (Apr. 1, 2004) 'Music Swappers Win Court Victory' Toronto Star, April 1, 2004.
- Harris, Lesley Ellen. (1998) Digital Property: Currency of the 21st Century. Toronto: Canada. McGraw-Hill Ryerson.
- Harris, Lesley Ellen. (2001) Canadian Copyright Law. Toronto: Canada. McGraw-Hill Ryerson.
- Intellectual Property Policy Directorate, Industry Canada. (2001) 'Consultation Paper on Digital Copyright Issues' Copyright Policy Branch, Canadian Heritage.
- Lambrecht, Bill. (1999) 'Amazon Tribal Leaders Challenge U.S. Patent: they say American has no right to plant used in healing' St. Louis Post-Dispatch, March 31, 1999.
- League for Programming Freedom (1991) 'Against Software Patents' [Online] Available: <http://lpf.ae.mit.edu/Patents/against-software-patents.html>

Lessig, Lawrence. (2001) The Future of Ideas: The Fate of the Commons in A Connected World. New York: NY. Random House.

Makin, Kirk. 'Ruling Rejects Licensing Fees' The Globe and Mail, March 5, 2004.

Maney, Kevin. (2004). 'CIA invests in start-ups. The payoff? Technology' [Online] Available: <http://www.pewinternet.org/index.asp>

McGray, Douglas. (2001) [Online] Available: <http://www.csmonitor.com/2001/1101/p19s1-bogn.htm>

Murray, Laura J. (2004) http://post.queensu.ca/~lm19/cr_policy.html

Pew Internet and American Life Project. 'Nearly Half of U.S. 'Net Users Post Content – Report.' Feb. 29, 2004 [Online] Available: <http://www.pewinternet.org/index.asp>

Samuelson, Pamela (1997). 'The U.S. Digital Agenda at the World Intellectual Property Organization.' [Online] Available: <http://www.sims.berkeley.edu/~pam/courses/cyberlaw97/docs/wipo.pdf>

Schelling, Jeffrey. (1998) Cyberlaw Canada: The Computer User's Legal Guide. Self Counsel Press.

Schumpeter, Joseph A. (1950) Capitalism, Socialism and Democracy. New York: NY. Harper & Row.

Skala, Matthew (2001). 'New Media Copyright Extensions Would Harm Canada' [Online] Available: <http://ansuz.sooke.bc.ca/icsub.html>

Smart & Biggar. 'Downloading Music from the Internet Held to be Legal in Canada by Copyright Board' [Online] Available: <http://www.smart-biggar.ca/Publications/publications.cfm?ThisID=206>

Smiers, Joost. 'Copyrights: A Choice of No-Choice for Artists and Third World Countries; the Public Domain is Losing Anyway.' [Online] Available: www.constantvzw.com/copy.cult/cjs0.html

Smiers, Joost. 'The Unavoidable Meltdown of Copyrights' [Online] Available: www.hku.nl/usa/centres/centres-en/cvo/papers_smiers/meltdown_of_copyrights.pdf

Standing Committee on Communications and Culture. (1985) A Charter of Rights for Creators: Report of the Sub-Committee on the Revision of Copyright. Canada. Minister of Supply and Services Canada.

Susanne, Charles. 'Human Genome Project: Is Eugenism Coming Back'. Global Bioethics, Vol. 13, N. 3-4, September-December 2000, p. 15

TallBear, Kimberly. 'The Tribal Specific Approach to Genetic Research and Technology' (2001) Presented at the R&D Management Conference, University of Victoria, Wellington, New Zealand, Feb. 9, 2001. [Online] Available: www.iiirm.org/publications/Genetics/tribalspecific.pdf

WTO website <http://www.wto.org/english>