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Intellectual Property Protection in Canada: The Technology Challenge

by Jim Keon*

I. INTRODUCTION

This paper examines the ability of Canada’s current intellectual property laws to provide adequate standards of protection in the face of the challenges posed by recent technologies. The following analysis will be presented.

Initially, an explanation of the nature and purpose of intellectual property protection in Canada will be provided. In addition, the study will point out Canada’s position as a net importer of intellectual and industrial material within the worldwide system of protection for intellectual property rights. This fact will highlight the need for development of Canadian policy, that among other goals, ensures the transfer of foreign intellectual and industrial knowledge to Canada.

Delineation of the current schemes of protection will set the stage for analyses of the problems created by certain recent technological developments. The technologies to be covered, and the policy issues raised by them, will include:

1. Computers—with special reference to programs, computerized use of copyright material and semiconductor chips;
2. Program Distribution Technology—especially cable retransmission systems;
3. Copying Technology—including reprographic and audio-video recording equipment and the resulting issues of private copying, rental of protected material; and
4. Biotechnology—focusing on the patentability of claims for biological inventions.1

The paper will outline gaps in the current schemes of protection, examine the nature of problems for the affected industries, and analyze approaches that have been suggested as effective solutions.

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1 See generally, B. Hughes & J. Woodley, Hughes and Woodley on Patents (1984); R. Hughes, Hughes on Trade Marks (1984); R. Hughes, Hughes on Copyright and Industrial Design (1984) (Detailing intellectual property systems in Canada).
II. BACKGROUND

A. Description of Intellectual Property Legislation in Canada\(^2\)

Statutory intellectual property protection is comprised of four main branches:

1) patents
2) trademarks
3) industrial designs
4) copyright

1. Patents

A patent is a document issued by the government which describes an invention and creates a legal situation in which the patented invention can only be exploited (made, used, sold, imported) with the authorization of the patentee. In Canada, the term of patent protection is 17 years. For an invention to be patentable, it must be new, e.g., it has not been known or used before; it must be non-obvious, e.g., any specialist in the same field would not have come up with the same solution; and it must be immediately applicable in industry, i.e., it can be manufactured or sold.

2. Trademarks

A trademark is a sign which serves to distinguish the goods of an industrial or commercial enterprise or group of such enterprises from those of others. No one other than the owner of the trademark may use it or any similar mark that would lead to confusion in the mind of the public. The protection for a trademark is generally not limited in time, provided that its use continues.

3. Industrial Designs

An industrial design law gives protection to designers of ornamental aspects of useful articles. The ornamental aspect may be three dimensional (the shape of the article) or two dimensional (lines, designs, colour), but must not be dictated solely by the function of the object. To be eligible for protection, industrial designs must be original or novel and must be registered. Protection means that it may not be copied or imitated without the owner's authorization. The term of protection lasts up to 10 years.

4. Copyrights

A copyright is the protection given to authors and creators of cultural and informational products such as books, records, films, and works of art against a variety of unauthorized uses (e.g., reproduction or

public performance of a musical work). Unlike patents, copyright does not prevent others from using or copying ideas embodied in the work; protection goes only to the form or expression of those ideas. Moreover, independent creation of the same or a similar work is not prohibited as long as there is no direct copying involved (e.g., many authors may write analyses of the last federal election without infringing each other’s copyright). There are no requirements to register a work to make it eligible for protection; protection arises automatically upon the creation of the work and generally lasts for the life of the author and fifty years thereafter.

5. Trade Secrets

In addition to these forms of statutory protection, there exists common law protection for trade secrets in respect to confidential commercially valuable information. Obligations of trade secrecy can apply to concepts, ideas, test results, factual information, etc. They arise when the information is treated in a confidential fashion by its owner and there is an appropriate relationship of trust with the alleged infringer. Unlike copyright, trade secrecy applies to the concept or idea as such and not the expression of the concept or idea. It is sometimes used instead of seeking a patent (e.g., the Coca Cola formula) since it is potentially of perpetual duration. On the other hand, unlike patents it does not prevent independent creation. The greatest weakness of trade secrecy law is that it does not apply to third parties who have no relationship to the person holding the secret.

B. The Economic Effect of Intellectual Property Protection

The main economic rationale for intellectual property protection is to increase the rate of production of intellectual works. In the absence of such protection, any enterprising individual could simply obtain a copy of the work and proceed to manufacture and distribute it to the buying public. Since he would not have to incur the initial costs involved in inventing or creating the work, he could market it at a lower price than the original inventor or creator could. Consequently, the economic incentive to produce intellectual property material would fall. Intellectual property protection is an attempt to overcome this problem.

Granting limited monopoly rights however, results in an inherent conflict: the improved compensation to inventors and creators resulting from these rights (provided to increase their output of new products) must be weighed against the reduction in the distribution of these same products because of the higher cost of this exclusive protection. As the Economic Council of Canada stated succinctly:

The higher returns provided to knowledge producers and processors and their innovative associates arise from higher prices to the users of the products involved (and, therefore, in smaller sales and output of them) than prevail in other circumstances. Individually, each of the new books, films, and other products will be scarcer and more expensive than it would be if some more efficient and less socially costly form of incentive could be brought into play.\(^4\)

Since the rights granted are limited in time, especially for industrial designs (ten years) and patents (seventeen years), this conflict is likewise limited. After the expiration of the term, society has the benefit of both the increased innovative activity and potentially reduced prices that result from greater competition.

Any comprehensive economic analysis of the efficiency of intellectual property statutes should be cast in terms of competing policy alternatives. For example, intellectual property laws are only one among many instruments used by governments to stimulate industrial and cultural growth. Such devices as awards, grants, subsidies, and tax concessions in favor of industrial research and certain forms of artistic activity are also widely used. The laws of patents, trademarks, industrial designs and copyright take their place therefore within a much broader group of policies used to reward innovative activities.

C. Canada’s Position in the World Intellectual Property System

Canada, along with almost all the world’s major countries, belongs to the major international conventions dealing with intellectual property: the Paris Convention for the Protection of Industrial Property, the Berne Convention for the Protection of Literary and Artistic Works, and the Universal Copyright Convention.

The first two of these conventions are administered by the World Intellectual Property Organization (WIPO), a specialized agency of the United Nations. The Universal Copyright Convention is administered by UNESCO. These conventions provide for the protection of intellectual property rights throughout the world. They require countries adhering to them to provide minimum levels of protection for inventors and creators. The major underlying principle of the conventions is that each state must provide the same protection to nationals of the other member states as it gives to its own nationals. Thus, for example, under the Canadian Patent Act, Americans receive the same protection as Canadians and, in the United States, Canadians likewise receive the same protection as do American citizens.

All of Canada’s major trading partners belong to these international conventions. Since Canadian inventors and creators receive national

\(^4\) Sub-Committee on the Revision of Copyright, A Charter of Rights for Creators (Proposing that Canada should protect foreign authors' works not covered by the international copyright treaties to which Canada adheres on the basis of reciprocity).
treatment protection in these countries, they benefit from Canada’s participation in these conventions. However, since some domestic industries relying on intellectual property protection (e.g., pharmaceuticals and films) are dominated by products created abroad, the national treatment requirements limit our ability to stimulate Canadian activity by intellectual property provisions alone. In these sectors, the benefits resulting from increased intellectual property protection will accrue mainly to the foreign interests; the costs, however, are borne by Canadian users, both industry and consumers. This situation is in contrast to that existing for many American industries (e.g., pharmaceuticals and film) where the domestic industry consists primarily of domestically produced products.

D. Need for Revision of Canada’s Intellectual Property Statutes

The Canadian intellectual property statutes described above are children of the 19th century and were developed at a time when the pace of development and exploitation of new technology was more leisurely. These conditions no longer exist today. In spite of subsequent amendments, judicial developments and administrative refinements, these laws cannot conceal the fact that many of their basic conceptions and principles were determined by the state of science and technology prevailing early in this century.

Technological development has created problems with the intellectual property statutes. In many instances, they are difficult to apply to problems which they were not designed to solve. Thus, industries such as cable and satellite communications, computer software, and biotechnology do not have clearly defined rules in relation to their intellectual property rights.

While problems exist in all four intellectual property statutes and with trade secrecy protection (especially with regard to computerized information) the legislation generally held to be most in need of amendment is the Copyright Act. Revision is required because changes in technology have rendered the Act ineffective in dealing with the new technologies. This result often arises because:

a) either there is no reference to a technology in the Act (e.g., computers), with the result that owners, users and the courts must extrapolate general concepts into a situation not envisaged at the time of passage of the Act; or

b) the almost contrary situation where the Act makes specific reference to technologies which have restricted interpretations, or created inequities in light of subsequent technological developments (e.g., the interpretation of the right of radio communication that excludes cable communications systems).

These uncertainties can discourage entrepreneurial activity, put Canadian industry at an international competitive disadvantage, and may

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increase the need for direct government intervention in the economy. All sectors involved in producing and using these high technology products are, therefore, in agreement on the need to update and clarify the rules of ownership governing their use although disagreements do remain as to the form the changes should take. As the noted economist Harold Demsetz has written:

Changes in knowledge result in changes in production functions, market values and aspirations. New techniques . . . invoke harmful and beneficial effects to which society has not been accustomed . . . . Emergence of new property rights takes place in response to the desire of the interacting parties for adjustment to new benefit-cost possibilities.6

The next section of this paper outlines the major areas in which the intellectual property statutes have been affected by technology. These technological changes have led to calls for changes in the property rights granted by the intellectual property statutes. For some of these problems, clear, effective solutions do exist. For others, the effective solutions are less obvious.

III. NEW TECHNOLOGIES

A. Computer Technology

Computers comprise one area where technological development has generated much uncertainty with the intellectual property statutes. This section of the paper will discuss the issues arising from the development of computer programs, computerized use of copyright material and semiconductor chips.

1. Programs

Various definitions of computer programs and software exist. One of the first proposed definitions for computer programs in an intellectual property context was contained in the WIPO Model Provisions on the Protection of Computer Software:7 'Computer Program' means a set of instructions capable, when incorporated in a machine-readable medium, of causing a machine having information-processing capabilities to indicate, perform or achieve a particular function, task or result.'

The essential element of this definition relates to the fact that the programs must be capable of causing a computer to perform a particular task. The program itself is to be distinguished from the more general term software which, in addition to the program, includes the program

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6 WORLD INT'L PROP. ORG., MODEL PROVISIONS ON THE PROTECTION OF COMPUTER SOFTWARE (1978) [hereinafter WIPO Model Provisions].
7 See generally, L. MILRAD, TRADE SECRET LAWS CAN AID DEVELOPERS, SOFTWARE REPORT, Nov. 1984, at 2-7 (For a fuller discussion of the benefits and limits of trade secrecy laws.).
description (e.g., procedural representation in verbal, schematic or other form) and other supporting material (e.g., user instructions).

Once a general method of solving a problem has been devised, the instructions to implement the solution are normally developed in "source code." The source code will be in one of several programming languages such as FORTRAN or COBOL which can be read by both the computer and the user and which appear as words, letters and numbers. These programs are then translated, usually by means of a program already in the computer, into "object code" or machine readable language which causes the computer to perform its task.

a. Existing Canadian Law

Patent protection is generally not available for computer programs per se and is usually thought not to be desirable since the scope of the monopoly would be such that all similar programs could be stopped from being developed for 17 years.\(^8\)

Computer programs can be protected by trade secrecy. There are, however, important limitations on the use of trade secrecy as a means of protection. Primary among these are the requirement to impose strict corporate security measures.\(^9\) Thus, this form of protection is not suitable for protecting ownership in widely-distributed programs since it is impossible to keep the secret and sell computer programs to the general public.

There has never been much controversy over whether computer programs in their source code form, together with flow charts, diagrams and other material on the basis of which programs are used, are protected by copyright. Copyright law has always protected utilitarian works such as telephone directories, scientific charts and instructions manuals. There have, however, been questions raised concerning protection for the object code although the courts to date have protected programs in this form too.

b. Issues

The 1984 Canadian White Paper on Copyright recommended treating human readable or source code programs differently than machine readable or object code programs.\(^10\) This distinction was based on the fact that, at the time of preparation of that document, it was not settled in Canada whether copyright protection extended to the machine control phase of programs.

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\(^8\) From Gutenberg to Telidon: A White Paper on Copyright, DEPT'S OF CONSUMER AND CORP. AFFAIRS AND COMM. (1984) (However, courts have since held that protection does extend to programs in object code).


\(^10\) M. Côté, Statement to Sub-Committee on the Revision of Copyright (May 30, 1985).
The rationale sometimes given for a differentiated approach is that copyright law was initially established to protect original works of authorship captured in any medium, i.e., books, records, films, etc., intended to communicate the work to humans. A computer program, once it enters a computer and is activated, does not communicate information intelligible to a human being. The direct product of a computer program is a series of electronic impulses which operate a computer. In its mechanical phase the program is a machine control element, a mechanical device.\(^\text{11}\)

Reaction to the White Paper proposals to distinguish between the human readable and machine readable phases of programs was, however, almost unanimously negative.\(^\text{12}\) Thus, the recent report of the parliamentary Sub-Committee rejected incorporating any distinction between machine readable and human readable programs.\(^\text{13}\)

The conclusion that traditional copyright protection is most appropriate for computer programs in all forms seems now to be generally accepted in Canada.\(^\text{14}\) This arises from the fact that the extent of protection provided by copyright is limited to the expression rather than the ideas contained in the program. Indeed, a fundamental principal of copyright protection is that it does not extend to ideas or information but merely the form of expressing those ideas.\(^\text{15}\)

Copyright protection for computer programs for the traditional term of copyright now appears to be the international norm.\(^\text{16}\) The U.S. was the first country to enact explicit copyright protection for computer programs. It also has the world's largest and most vigorously competitive computer software industry.\(^\text{17}\) The innovation and progress that has occurred has for the most part been the result of refinements or adaptations of existing programs and has not been constrained by copyright protection. All available evidence suggests that these healthy economic trends, including increasingly competitive pricing behavior, will continue with firms increasingly relying on the copyright in the software to license

\(^{11}\) Sub-Committee on the Revision of Copyright, supra note 5 (Minister Côté, also rejected making such a distinction).


\(^{14}\) See World Int'l Prop. Org., Summary of Replies Received from Gov'ts and Int'l Organizations to WIPO Invitation to Present Observations Concerning the Legal Protection of Computer Software (1984).

\(^{15}\) Keplinger, Authorship in the Information Age: Protection for Computer Programs Under the Berne and Universal Copyright Conventions, Copyright, Mar. 1985, at 126.


\(^{17}\) See Gov't of Canada, Response to the Sub-Committee on the Revision of Copyright (Feb. 1986).
and exploit it in the marketplace.\textsuperscript{18}

To date, no deleterious economic results can be traced to the granting of full explicit copyright protection. Indeed, the certainty resulting from clear statutory guidance appears to have contributed to both international and domestic trade in these products. It is now expected that Canada will also introduce measures to provide full statutory copyright protection in the near future.\textsuperscript{19}

2. Computerized Use of Copyright Material

The computerized storage and retrieval of works protected by copyright raises certain questions in the copyright context.\textsuperscript{20} In particular, discussions and some disagreement have occurred regarding cases where pre-existing works are put into computers. This is an important consideration since it is now technically possible to put any kind of copyright work into a computer.

The computer has taught us to translate all kinds of information into a digital form - not only numbers, but also words, musical notes, sounds and images. Anything can be expressed in the binary code. Information in such a form can be stored on various recording devices, reproduced, electronically transmitted, and transformed in various ways.\textsuperscript{21}

a. Existing Canadian Law

There is general agreement that storage of any material protected by copyright in a computer is an act which should require the permission of the copyright owner. Section 3(1) of the present Canadian Copyright Act gives the owner the sole right to "reproduce the work . . . in any material form." Thus, protection would seem to extend to reproduction in a computer in the same manner that reproduction in other forms is covered. Given this situation, it is not clear that new standards or criteria need to be devised.\textsuperscript{22} The general right of reproduction would appear to cover the input of material to a computer.


\textsuperscript{19} WORLD INT'L PROP. ORG., supra note 13, at 39.

\textsuperscript{20} J. PALMER AND R. RESENDES, supra note 14, at 41. Despite the provisions of § 3 of the Copyright Act of Canada regarding reproduction, views have been expressed that more certainty is required. This led the Sub-Committee on Copyright Revision to recommend the establishment of a new right to input works to a computer.


\textsuperscript{22} For the Display Right under United States law see The Copyright Act of 1976 §§ 105(b), 109(8). The United States has urged Canada to similarly introduce this new right in order to increase harmony between the two countries' laws, U.S. Gov't. Submission on Copyright Revision: Sub-Committee Hearing on Copyright Revision.
b. Issues

Questions remain, however, as to whether additional rights might be required. More specifically, some have argued for a right to control the display of works on a computer terminal. It is unlikely that interpretation of rights currently provided, such as the rights of reproduction or public performance, would be broad enough to cover the use of impermanent images projected on a computer screen in the typical work place or home situation. Networking is now commonplace and one central computer can service several terminals. Thus, one legitimately purchased copy of a copyright data base, for instance, can serve many users without a need to make or distribute extra copies.

This arguably reduces revenues to copyright holders. It is not, however, entirely clear that this is the case. Such display can be compared to the reading of a book which clearly does not involve copyright infringement or require payment. Moreover, requiring permission to input material to a computer as recommended above allows the copyright owner the opportunity to control the price to be paid for it. By contract, the price can be tied to reflect expected usage.23 In this manner, the market efficiency envisaged by the copyright system would seem to be encouraged.

Nevertheless, the concern remains that the copyright owner's ability to control the use of his work in networking situations, and thus ensure proper economic returns, needs to be improved through the granting of a new right giving them the explicit right to control displays of their work.24 If such an approach is to be adopted, careful consideration will have to be given to limiting the right so as to ensure that costs and access problems for users are not unduly increased.

3. Semiconductor Chips

In November 1984, the United States passed legislation to protect the designs of semiconductor chips.25 This was done to give clear protection to an industry that was estimated to have sales of $14 billion in 1984.26 The legislation's proponents argued that protection was essential to combat the rising incidence of chip piracy which could hamper firms' ability to invest in research and development in this sector.

a. Existing Canadian Law

Copyright law is not relied upon to protect against chip piracy since

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under copyright law only the artistic features of a useful article can be protected and only if they can exist independently from the utilitarian aspects of the article. Industrial design protection extends only to the decorative features of designs not solely dictated by the function of the object. As the pattern or design of a semiconductor chip is clearly dictated by utilitarian requirements, the design is not protectable by industrial design. Patents are similarly believed to be ineffective since a patent for the process of making the chip or the chip itself as an article of manufacture would not ordinarily protect against a taking of the design.

b. Issues

As a result of this apparent lack of protection under existing intellectual property statutes, the U.S. opted for special chip protection in a sui generis (self-contained) format as a separate chapter of its Copyright Act. This legislation provides a more limited form of protection than is provided under traditional copyright.

Eight aspects in which this legislation differs from copyright law have been identified:

1. The term is only 10 years.
2. There is compulsory registration for commercially exploited chips.
3. There is a provision legitimizing "reverse engineering" which arguably goes well beyond any limits of "fair use."
4. There is an apparently generous "innocent infringement" provision.
5. There is an optional notice or marking provision, with a strong incentive for its use.
6. There is a new threshold of originality concept in the legislation which is higher than for copyright and lower than for patent protection.
7. There is an explicit "first sale" and exhaustion provision.
8. The legislation is "reciprocal" rather than "national treatment" in nature.

The last point is perhaps the most significant. Protection of foreign-owned chips is conditional on American chips being protected in the foreign jurisdiction. The clear intent of the U.S. legislation is to use leverage to bring countries in line with U.S. standards. The legislation does provide for interim protection to foreigners without the necessity of reciprocal legislation if the foreign nation is making good faith efforts towards providing similar protection. On the basis of petitions filed by four Canadian associations supported by a statement of the Minister of Consumer and Corporate Affairs affirming that "the development of a specific pol-

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28 Sub-Committee on the Revision of Copyright, supra note 4, at 47.
icy with respect to the protection of mask works is of high priority within
the framework of copyright revision,” interim protection was provided to
Canadian firms for one year beginning in June 1985.29

The Sub-Committee on Revision of Copyright30 also supported pro-
tection for semiconductor chip designs and the government has con-
firmed this position in its response to that report although it differed
from the Sub-Committee by stating that protection should be provided
within the Copyright Act.31 Explicit recognition was made of the need
to alter some aspects of traditional copyright protection to adapt to the
special needs of semiconductor chips. This may well entail a sui generis
chapter of a revised Copyright Act dealing with semiconductor chip
legislation.

The challenge to Canadian legislators now is to fashion protection
which gives us harmony with the law of our major trading partner and
meets the needs of the domestic Canadian industry which, with a few
notable exceptions, is currently not a large player in this market.

A movement towards international harmonization has already be-
gun. Member countries of the World Intellectual Property Organization
have met once to consider a draft treaty covering semiconductor chips.
Further meetings are planned.

The passage of sui generis protection for semiconductor chips which
is tailored to the specific needs of that industry represents a significant
development for intellectual property systems. It is the only area of tech-
nology discussed in this paper where the decision has been made that
existing laws were not flexible enough to incorporate it effectively. It will
be interesting to follow the further development of the law in this field to
see if it is successful in providing clear and effective protection for the
chip industry and whether it is the precursor of similar sui generis types
of intellectual property legislation.

B. Program Distribution Technology

1. Cable Retransmission

The introduction of cable television systems into Canada occurred
in the 1950s shortly after the advent of television itself. Cable has proven
to be extremely popular in Canada. Recent estimates indicate that 59%
of Canadian households (more than 5 million) are already served by
cable systems with over 80% having access to it.32

29 Gov’t of Canada, supra note 17.
30 APPLEBAUM & HEBERT, REPORT OF THE FEDERAL CULTURAL POLICY REVIEW COMMIT-
TEE 283 (1982).
Committee on Extension of Services to Northern and Remote Communities (CRTC 1980) and The
Cost of Choice (CRTC 1985).
of Authors, Performers, Producers of Phonographs and Broadcasting Organization in Connection
with Distribution of Programs by Cable (March 1984).
Initially, many cable systems picked up broadcast signals directly by means of large antennas. Later, microwave relay allowed signals to be sent over much longer distances. These terrestrial means of transmitting programs provided wide ranging access to Canadian and American programming for the majority of the population. Still, however, there continued to be a problem of access for households in small and/or remote communities. This led to the desire to increase services to these communities by satellite technology. In 1983, Canadian Satellite Communications Inc. (CANCOM) began operations to provide television programs by satellite to cable systems in northern and remote communities. Thus, today in Canada cable systems retransmit broadcast programs received either directly over the air, through microwave relay systems or from satellites.

The simultaneous distribution by cable of a broadcast is generally referred to as a “rediffusion” or “retransmission.” Where the cable operator prepares or originates his own programming, this is referred to as “cable originated programming.” The main attraction for cable subscribers is the retransmission function of cable which brings a marked improvement in signal quality and a much wider choice of broadcast program material. A recent addition to the Canadian cable television service market is Pay Television which entered the Canadian market in 1983. Its services are sold to subscribers through cable television systems. Pay T.V. channels now provide a range of specialty programming from movies and music to sports.

a. Existing Canadian Law

Whether the cable system is retransmitting broadcasters’ programs, pay T.V. channels or originating its own, it is making use of material protected by copyright. The Canadian Admiral case held in 1954 that the retransmission of signals embodying copyright material was neither a “radio communication” S.3(1)(f) or a “public performance” S.3(1) of the work and thus did not constitute an infringement of copyright. As a result of this decision, cable television systems are generally immune from copyright liability under current Canadian law.

33 See generally V. Nabham, La cable-télevision et la loé canadienne sur le droit d’auteur (Paper given at ASSOCIATION LITERAIRE ET ARTISTIQUE INTERNATIONALE, May 1982).
34 Canadian Admiral Corp. Ltd. v. Rediffusion, Inc., Ex. C.R. 382 (1954) (The court decided that the defendant held communicated the work by cable and not by electro-magnetic or Hertzian waves through the ether, as required for a radio Communication under Canadian Law, and that programs received by subscribers in the home should be construed as essentially private in nature and were not a performance in public).
35 DEP'TS. OF CONSUMER AND CORP. AFFAIRS AND COMM., supra note 8, at 100-07.
36 S. Liebowitz, COPYRIGHT OBLIGATIONS FOR CABLE TELEVISION: PROS AND CONS at ii (1980).
37 Morgan, Cable, Computers, Copyright and Canadian Culture, 1985 INTELL. PROP. L. REV 69-91 (Concluding that the balance of arguments weigh against imposing copyright liability for retransmission).
b. Issues

Given the economic importance of cable television and the fact that its activities are largely outside the scope of the current Copyright Act, it is not surprising that the question of retransmission liability has been the most controversial for copyright revision policymakers.  

Copyright owners and broadcasters argue that retransmission of a creator's property without payment or authorization is contrary to the primary objective of copyright law which gives creators the right to prohibit use of their material. Further, they claim that cable television reduces advertising revenues of broadcasters by fragmenting the local viewing market.

[Cable] . . . is known to cause "market fragmentation." In other words, viewers in a given locality who might have access to one station, say station X, prior to the introduction of CATV will have, after the introduction of CATV, many more stations which they may watch. Station X's share of the local audience will drop because people on Cable will watch some of the distant stations brought in by Cable. The loss of viewers to station X is the gain to distant stations. On the other hand, viewers in distant localities will be able to watch station X on their Cable and this will tend to increase station X's audience. Even if station X's total audience remains the same, the average distance from transmitter to viewer has increased. This is market fragmentation.

This fragmentation is believed to reduce advertising revenues because advertisers in a given locality may not value viewers in a distant locality as much as they value local viewers.

A decision to impose copyright liability for retransmission activities is complicated by a number of factors. The first relates to the difficulty in determining the overall net impact that cable has on the broadcasting market. This makes determination of the appropriateness of a retransmission liability equally difficult. Strict copyright liability could also conflict with Canadian Radio-Television and Telecommunications Commission (CRTC) "must carry" rules which mandate carriage of particular stations. Further, given viewing patterns, it is probable that the majority of royalties flowing from a retransmission right would go to foreign (American) rather than Canadian copyright owners. There is also a desire not to unduly increase the cost of cable services to small and isolated Canadian communities relying on cable for access to distant pro-
gramming. Finally, there is a concern to ensure that whatever system is put in place is not so costly to operate as to defeat its purpose.

Because of these difficulties, the government took no final position on the retransmission issue in 1984 in its White Paper on copyright. More recently, in its response to the Sub-Committee report on copyright, the Canadian government has stated its support for retransmission liability but has called for further study by a reconstituted Copyright Appeal Board as to the nature of the copyright scheme to be adopted.

The essential question has now been answered by government. Cable retransmission will attract liability. The difficult questions as to the nature of the rights to be given to the various categories of rights owners and how those rights should be administered (individually, collectively, subject to a compulsory license, regulated by a tribunal, etc.) remain to be determined. Experience to date with the U.S. system indicates that great care will need to go into the development of an effective solution.

C. Copying Technology

1. Reprographic Equipment

The term reprography is used in a broad sense to describe the making of visually perceptible copies of printed material. The definition covers printed matter of all sorts including scientific, literary, musical, pictorial, or graphic works. Reprography is now an integral part of daily life in schools, government and commercial and industrial institutions.

a. Existing Canadian Law

The Canadian Copyright Act gives the author the sole right . . . to reproduce the work or any substantial part thereof in any material form whatsoever.” S.3(1). Photocopying obviously involves reproducing a work and thus typically is an infringement. There are, however, fair dealing provisions which may legitimatize some activities: “The following acts do not constitute an infringement of copyright: a) any fair dealing with any work for the purposes of private study, research, criticism, review or newspaper summary.” S.17(2)

The first two of these purposes, private study and research, may

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43 A form of collective agreement does exist in Quebec between la Fédération des Collèges d'enseignement général et professionnel, l'Association des Collèges du Québec et L'Union des écrivains québécois (UNEQ).
44 See generally DEPT'S OF CONSUMER AND CORP. AFFAIRS AND COMM., supra note 8, at 61; Sub-Committee on the Revision of Copyright, supra note 5, at 88 and Gov't of Canada, supra note 19, at 15.
45 See generally SUBMISSION OF THE DIRECTOR OF INVESTMENT AND RESEARCH; SUB-COMMITTEE ON THE REVISION OF COPYRIGHT.
46 But see S. LIEBOWITZ, THE IMPACT OF REPROGRAPHY ON THE COPYRIGHT SYSTEM (1981) (Liebowitz argues that the journal publishers capture the value of photocopying done at institutions by charging).
sometimes provide impunity for students or researchers when making copies. However, there has been no case law directly on this issue in Canada. Thus it is very unclear to what extent photocopying represents a violation of the law.

b. Issues

This confusion with the existing law has led groups such as librarians and educators, who make extensive use of photocopying, to call for the establishment of clear rules and procedures. Publishers and authors for their part feel that much photocopying is not only illegal but also causes economic harm. They, therefore, argue for the development of a system that will allow convenient photocopying and which will also channel payment to them for the use of their works.

Collectives are the generally favoured channel to compensate copyright holder for the photocopying of their works. A collective agency generally takes assignments or licenses from copyright owners in order to exploit and enforce the copyright in the assigned works on a collective basis. Such a system clearly reduces the costs of administration for copyright owners. Collective exercise of rights can also give users of works confirmation of their right to use material with impunity. The goal of publishers and authors is to compile a comprehensive repertory of copyrighted printed matter which could be licenced to libraries and educators for use. The use of copying of works would be "metered" by statistical samples. On this basis annual fees for usage could be collected and the proceeds distributed to appropriate copyright holders.

Photocopying collectives have been slow to form in Canada. One reason for this has been concern that the organized setting of rates for use of copyright works may be counter to the Combines Investigation Act. For this reason various studies, while calling for the wider use of collectives, have also recommended that they be subject to the control of a government tribunal or board. Collectives falling under the jurisdiction of such a tribunal would fall under the "regulated conduct" exemption to the Combines Investigation Act.

The expanded use of collectives to licence photocopying in government, educational and business institutions is likely to increase. It allows

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47 STATISTICS CANADA, HOUSEHOLD FACILITIES AND EQUIPMENT, Cat. No. 64-202.
50 See V. NABHAN, QUELQUES ASPÈCTS DES PROBLÈMES JURIDIQUES POSÉS PAR LA VIDEOREPRODUCTION: L'AFFAIRE BETAMAX ET SES REPÉRCUSSIONS AU CANADA (La service du droit d'auteur Vol. I, 7-25) (Concluding that if the decision of the Betamax case had been made using Canadian fair dealing criteria, the practice of home video taping would be considered illegal).
52 For a more detailed discussion of possible legislative alternatives see D. MAGNUSSON & V. NABHAN, supra note 41, at 198-210.
users immediate and convenient access without disregarding the creator's exclusive right to control the reproduction of his work. The collective exercise of photocopying should reduce conflict and the need for specific legislation on photocopying. Copyright principles would be maintained while meeting the needs of users.  

2. Audio and Video Recording Equipment  
a. Private Copying  
In contrast to the mainly institutional practice of photocopying, most audio and video copying takes place at home. Surveys have shown that approximately 55% of Canadian homes now have some form of audio recording equipment. In the majority of such homes, these recorders are used to tape copyrighted works, mainly music. By 1985, video cassette recorder (VCR) ownership stood at 29% of Canadian homes. The two major uses of VCRs are to tape television programs for later viewing (time shifting) and to watch rented movies.

i. Existing Canadian Law  
As noted in the discussion on photocopying the Canadian Copyright Act provides the owner of the copyright with the exclusive right to produce or reproduce his work or any substantial part of it. This exclusive right is subject to a number of qualifications and exceptions. For instance, certain made at home copies would not be infringing if they fell within the ambit of the fair dealing provisions.  
However, most home audio or video copies are made for personal enjoyment and not for private study, review, etc. As such they would probably not fall within one of the stated fair dealing purposes and would, therefore, appear to be infringing copies.

ii. Issues  
Copyright owners in both the record and film industries argue that home recordings deprive them of revenues. While the evidence is mixed there does appear to be some justification to these claims. This result, combined with the fact that most home copying is probably illegal, presents governments with difficult policy options. Several options do, however, exist. The first would be to create an express exemption and exclude home taping from the category of infringing activities. A second approach would be to construct a system which would provide impunity.

53 See Sub-Committee on the Revision of Copyright, supra note 4, at 73-76.  
54 See Gov't of Canada, supra note 17, at 13.  
55 See NORDICITY GROUP LIMITED, supra note 49.  
56 See generally H. KNOFF, THE PROPOSED RENTAL RIGHT FOR VIDEO AND SOUND RECORDINGS 39.  
57 H. FOX, CANADIAN LAW OF COPYRIGHT 287 (1967).  
58 H. KNOFF, supra note 56, at 6.
for home tapers with remuneration to be paid to the copyright owners in the form of a copyright levy on the home taping equipment and/or the blank tapes themselves. A third option would be to leave the Act as it is but allow for the imposition of a levy scheme at some point in the future. A fourth option would be to legitimatize home taping and apply a tax on the sale of the equipment and/or tapes. The proceeds of the tax could then be distributed by government as compensation to copyright owners for the use being made of their work.\textsuperscript{59}

Legitimization in the absence of a compensation scheme would be vehemently opposed by copyright owners. They are concerned that the removal of statutory rights now would make it extremely difficult to introduce a compensation scheme at some point in the future since they would be arguing from a weakened legal position.

Copyright owners advocate a levy on either blank tapes or machines, such as now exists in a number of European countries, as the most appropriate solution.\textsuperscript{60} This levy would be seen as compensation for royalties alleged to be lost from decreased sales because the home copiers are not purchasing copies.

Unavoidably, however, there will be many inequities arising from any levy scheme. Blank tapes are used for many purposes in addition to taping copyrighted material. They are, to a great extent, used for office dictation and amateur home recordings which have nothing to do with copyright infringement. A further important factor that must be considered is that a levy scheme operating within the Copyright Act will require that payments be made to Canadians and non-Canadians alike, due to Canada's international copyright obligations.

In connection with this, it is significant to note that Canada's major trading partner in the recording and film industries, the United States, does not have a home taping compensation scheme for copyright holders. A levy formula or some other scheme will necessarily result in higher costs to Canadian consumers. The majority of the funds generated by such a scheme would flow to American artists, composers and companies whose own government has not seen fit to provide such payment.

Many problems remain to be ironed out before any compensation scheme can be introduced. For this reason, the government has decided that this issue needs to be examined further before a final decision is taken.\textsuperscript{61}

b. Rental

Outlets renting videocassettes are now ubiquitous in Canada. The size of the Canadian video rental market has been estimated at $530 mil-

\textsuperscript{59} Sub-Committee on the Revision of Copyright, \textit{supra} note 4, at 17.

\textsuperscript{60} Cf. S. Liebowitz, \textit{supra} note 46 (argument for photocopying and the tiered pricing scheme for journals is analogous).

\textsuperscript{61} H. Knopf, \textit{supra} note 56, at 17.
lion in 1984.\textsuperscript{62} Rental markets for other copyright works such as records are much more limited or almost nonexistent. A type of rental market does exist, however, in the computer software sector. Retail outlets will rent software for evaluation purposes for a small charge. Often the evaluator will take the software home and copy it onto a blank disk selling at a fraction of the cost of the legitimate software copy.\textsuperscript{63} No good evidence yet exists on the total size of this practice.

i. Existing Canadian Law

There is nothing in current Canadian intellectual property law to give a copyright owner of a film, record or computer program the right to control or prevent the renting of his work. There is no explicit statutory "first sale doctrine" in Canada but legal principles have established that a copyright owner cannot control the use of copies containing a work once that work has been sold.\textsuperscript{64}

Attempts were made in the United States to control the rental of videocassettes through contractual means. These attempts faltered, however, as a result of practical and legal difficulties in enforcing contracts against third parties not bound by the agreement.\textsuperscript{65}

ii. Issues

The economic argument for a rental right, giving copyright owners the right to control the rental of their product, is that it would provide increased royalties and thus incentives for producers to make a better product available in greater quantities. Copyright owners contend that renting deprives them of revenue in two ways: first no royalties are paid on the rental; and second the rental may displace a sale to which royalties would be paid.\textsuperscript{66}

On the other hand, evidence suggests that in the video market industry practice is to levy a much higher price to the dealer than is required to realize a profit. This extra charge is intended to implicitly capture the rental value of a cassette.\textsuperscript{67}

Nonetheless, the belief remains that royalties would increase with an explicit right to control rentals. The video rental market is highly com-

\textsuperscript{62} DEP'TS OF CONSUMER AND CORP. AFFAIRS AND COMM., supra note 8, at 20; Sub-Committee on the Revision of Copyright, supra note 4, at 73.
\textsuperscript{63} Gov't of Canada, supra note 17, at 13.
\textsuperscript{64} CAN. RECORDING ASS'N & CAN. MOTION PICTURE DISTRIBUTORS ASS'N, A PROPOSAL TO INCREASE PENALTIES FOR CRIMINAL COPYRIGHT INFRINGEMENT OF FILMS, RECORDS AND TAPES UNDER THE COPYRIGHT ACT. See also WORLD INT'L PROP. ORG., WORLDWIDE FORUM ON THE PIRACY OF SOUND AND AUDIO-VISUAL RECORDINGS (1981).
\textsuperscript{65} Software Producers Want Copyright Law Amended Quickly, Globe and Mail, Mar. 6, 1986 at C6.
\textsuperscript{66} Sub-Committee on the Revision of Copyright, supra note 4, at 98.
petitive. Some evidence suggests that at current rental prices demand is inelastic. Thus it is felt that total revenues could increase if prices were raised as a result of introduction of a rental right.

For the recording industry the analysis is different. As indicated there are currently only negligible record rentals. Such markets do, however, exist in other countries, notably Japan. The recording industry is concerned that the new compact discs which provide higher quality sound and which can be repeatedly played without damaging the quality, albeit at a substantially higher price than existing records and tapes, may spark the development of a rental demand in North America. The rented copies would be used to make copies at home similar to the situation for computer software. A rental right does exist for records in the U.S. It appears that the record industry is using it not to collect royalties but rather to prohibit rentals as a means of limiting home copying.

The computer industry argument for a rental right relates to the need to control rentals to reduce home copying of software. If significant rental markets arise in other sectors, calls for legal protection to control the activity will similarly be made.

Recent Canadian reports have advocated the introduction of a rental right. The current government, while agreeing with the objective of these recommendations, stated that it wanted to examine the issue further.

Factors to be examined further could include the impact such a right might have on the existing rental industry, particularly the video sector, and the extent to which increased rental revenues would be paid to foreign rights holders. The video rental sector is heavily dominated by American feature film “blockbusters.” Given this, the main impact of this proposal may be to distribute income from Canadian consumers (renters) to primarily American owned film companies. Undoubtedly this factor will be carefully weighed before any final government position is taken.

c. Piracy—Counterfeiting

Piracy refers to the unauthorized manufacture, sale or other distribution of copyright works. “Unauthorized” in this context means unauthorized by the rights owner whose authorization is required for copying and distribution. In cases where a near duplicate of the legitimate product (including its label, packaging, artwork, logo and trademark) takes place, the product is referred to as a counterfeit. The same advances in copying and playback technology that have created copyright problems

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68 A. BULL, G. HOLT, & M. LILLY, INT’L TRENDS AND PERSPECTIVES IN BIOTECHNOLOGY (1982).
with respect to the home copying and rental issues have also allowed for massive copying and selling of pirate or counterfeit product. Audio/video\textsuperscript{71} and more recently computer software piracy\textsuperscript{72} represent a severe and growing activity which is detrimental to legitimate producers.

i. Existing Canadian Law

Piracy is illegal under current Canadian law. Holders of copyright and trade marks can bring civil action for infringement but often the guilty party has few seizable assets. Summary criminal sanctions do exist in s.25 of the Copyright Act but the maximum fines are $10 per infringing copy and are not to exceed $200 in respect of the same transaction. Some recent court decisions have provided a further form of relief by holding that some types of piracy may amount to criminal fraud under s.338 of the Criminal Code. There are also ss.364-369 of the Criminal Code which create offences for forgeries of trade marks and trade descriptions.

ii. Issues

The clear policy objective on this issue must be to create, to the extent possible, an infringement-free business environment for rights owners. The most straightforward means of accomplishing this for audio, video and computer software piracy would seem to be to increase the criminal remedies provisions of the Copyright Act to meaningful levels. Recent proposals\textsuperscript{73} have recommended that the upper limit for fines be $1 million. Such proposals seem in line with the state's interest in ensuring that the purpose of its legislation (e.g., stimulation of creative output) is not undermined.

D. Biotechnology

The issue of the scope of intellectual property protection to be given for life forms or processes for producing or altering them has acquired importance in the last few years. The industrial applications of these processes have sparked worldwide technological interest and development, with the United States and Japan as the leading competitors.\textsuperscript{74}

A 1982 OECD study\textsuperscript{75} contains a breakdown of a wide range of

\textsuperscript{71} MINISTRY OF STATE FOR SCIENCE AND TECHNOLOGY, BIOTECHNOLOGY: A DEVELOPMENT PLAN FOR CANADA (1981).

\textsuperscript{72} 62 CAN. PATENT REV. 2d 81, at 90 (1982).

\textsuperscript{73} WORLD INT'L PROP. ORG., INDUSTRIAL PROPERTY PROTECTION OF BIOTECHNOLOGICAL INVENTIONS (For the second session of the Committee of Experts on Biotechnological Inventions and Industrial Property, Feb. 1986).


\textsuperscript{75} For a fuller debate, see INT'L UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS, THE PROTECTION OF PLANT VARIETIES AND THE DEBATE ON BIOTECHNOLOGICAL INVENTIONS (1985).
biotechnology industrial sectors including chemicals, pharmaceuticals, energy, food, agriculture, and service industries such as water purification or waste management. In Canada, development has been slow. "Canada is at the very bottom of OECD countries in per capita investment in pharmaceutical R&D research and last in per capita investment in biotechnology."  

The Science Council of Canada 77 feels that Canadian efforts should be focused on the natural resource sector where Canada already enjoys a comparative advantage. The Council is of the opinion that international competition in sectors such as health care is too severe for Canadian companies to compete meaningfully.

A 1981 Canadian government paper 78 did, however, call for biotechnology as a long-term economic development priority. Among other elements of a national biotechnology strategy, it called for a review of regulations relating to biotechnology including patent legislation.

1. Existing Canadian Law

In 1982, the Canadian Commissioner of Patents upheld a ruling of the Patent Appeal Board in the Abitibi case 79 that, in effect, means that claims to new and useful man-modified micro-organisms and to processes for making them qualify under s.2 of the Patent Act as arts processes, machines, manufactures or compositions of matter and might be eligible for patent protection. The ruling covers micro-organisms but implies that higher life forms could fall within one of the s.2 categories and be eligible for protection as well.

Further, Patent Office practice has, in effect, meant that no special conditions are applied in Canada on biotechnology inventions with respect to traditional patent standards of novelty, inventive step or industrial applicability. As a result it is conceivable, for instance, that new types of plants could be held to be patentable although it is understood that current Patent Office practice is to refuse any such applications that it may now receive.

As regards the question of providing protection for animal varieties, it is Patent Office practice to refuse such applications as well. To date, there has been no concerted demand for such protection in Canada.

2. Issues

Consideration of intellectual property protection for biotechnological inventions raises important questions:

[I]t appears doubtful whether protection should be granted for inven-

76 Thompson, supra note 69, at 68.
tions relating to living matter; traditionally, technology has been understood as an art to cause certain effects in inanimate matter. Secondly, because of the unique features of each living entity, it appears difficult, if not impossible, to describe biotechnological inventions in a manner enabling an expert to repeat the result obtained by the inventor.  

Regarding the exclusion of living matter, it is worth noting that several national patent offices, including the European Patent Office, do not permit the patenting of plant varieties, animal varieties, and essentially biological processes for producing them. In contrast, the U.S. Supreme Court in the Chakrabarty case has recognized the patentability of living matter. As indicated, while there is no such explicit exclusion in Canadian law, the Canadian Patent Office rejects applications of such matter, accentuating the uncertainty of Canadian law in this regard.

Another important issue concerns the possibility that the Canadian Patent Act, in its present form, may overlap with proposed plant breeders' rights legislation in the sense that certain inventions could qualify at the same time for a patent and a plant variety right. Should one and the same invention at the same time be eligible for a patent and for a plant variety right? A proper answer to this question must balance the interests society has in promoting new technologies with the public interest in maintaining a reasonable limitation on monopoly rights.

Given the prospects for economic growth in biotechnology, most would agree that Canada cannot afford to continue its very low levels of investment in it, especially in the traditionally strong sectors of agriculture, forestry, and mining. To facilitate commercialization in Canada, it will be important to reduce uncertainty regarding the availability of patent protection to a minimum. To do this, decisions on the degree to which higher life forms can be patented and the demarcation between patent and plant breeders’ rights legislation must be settled.

IV. CONCLUSIONS

None of Canada's existing intellectual property statutes have been overhauled in more than thirty years. The Copyright Act, the statute for which new technologies pose the greatest challenge, has gone more than sixty years without being revamped. Technologies have been developed leading to new types and new uses of subject matter that could not possi-

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80 Industrial Property Protection of Biotechnological Inventions, Int'l Bureau of WIPO; report for the second session of the Committee of Experts on Biotechnological Inventions and Industrial Property (Feb. 1986). In addition to these fundamental questions regarding the scope of protection, there are other technical questions such as whether the deposit of a micro-organism can adequately supplement the normal patent requirement of full written disclosure of the invention.

81 See Cooper, supra note 74, for an assessment of a previous bill to introduce plant breeders' rights legislation in Canada.

82 See INT'L UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS, supra note 75.
bly have been foreseen at the time of passage of these laws. Despite their age, however, the statutes have proven to be surprisingly resilient.

Four types of new technologies were examined in this study: computer technology, program distribution technology, copying technology and biotechnology. In some cases the solutions to the issues raised by the technologies seem straightforward. This is true in the following three areas:

a) making explicit the copyright protection for computer programs;

b) giving clear, statutory guidance that permission is required to input copyright material into computers; and,

c) increasing the penalties for piracy.

For another subset of issues the direction of required changes is clear but the method of implementing a viable Canadian system remains to be refined. Included in this grouping would be:

a) the form of protection to be given to semiconductors chips;

b) the system of protection for cable retransmission activities;

c) a system of reimbursing authors and publishers for photocopying and;

d) the codification of patent principles relating to biotechnological inventions.

There is a final group of issues for which practical, effective solutions satisfying the majority of affected parties are not yet apparent:

a) compensation schemes for home copying and;

b) renting copyrighted works.

In all cases but one the proposed solutions which have been examined have involved amendments to the existing Copyright Act or Patent Act. For one area, semiconductor chips, it appears as if the growing international consensus is towards a sui generis approach along lines similar to recent U.S. legislation.

Revisions to existing Canadian intellectual property statutes are needed and will undoubtedly be forthcoming. Revisions have been made in other countries in response to new technological methods of producing and using intellectual property material. These statutes have proven to be resilient and flexible in developing to meet new challenges. This paper's analysis indicates that with appropriate amendments these laws will be able to continue to give protection to creators and inventors in a manner beneficial to Canadians.