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LEGAL PROTECTION OF
COMPUTER SOFTWARE IN CANADA

Thesis presented to the School of Graduate Studies
of the University of Ottawa
towards the degree of LL.M.

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Canada

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UNIVERSITÉ D'OTTAWA
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INTRODUCTION

The object of this thesis is to survey whether computer software is protected by Canadian law. Software is the essence of the computer revolution. It is a sequence of instructions which determine the functions to be executed by the machine. The program animates a computer, transforming machine hardware into a tool for information processing.

A great deal of time and effort is invested in the development of a software package. All this can be lost when the program is copied. Replication can be effected on a large scale within a matter of seconds. This is damaging to the originator of the program who is prevented from recovering the costs of research and development. Depending on the type of copy program used, the pirated copy may be poorer in quality and diminish the goodwill attaching to the original software. Such problems have induced software developers to seek commercial protection in the form of proprietary rights in the program. The branch of legal protection primarily invoked is that of intellectual property.

1. Traditional Means of Protecting Intellectual Property

Where an inventor or creator captures the intangible qualities of nature and produces an aesthetic or utilitarian work, society may express its appreciation by bestowal of a right in rem. An intellectual proprietary right which is conferred by patent or copyright legislation is potentially

more valuable than payment for services, because it is enforceable against third parties. Programmers contend that proprietary protection would enable the technology to flourish. Such form of protection would serve as an incentive to devote research and development in this area since it is more likely that these costs could be recouped.

The scope of this type of award is broad since it is monopolistic. The monopoly is circumscribed by formal and substantial parameters which reflect the public right to knowledge, and its application.

Patents and copyright are two different types of intellectual property rights. Both are designed to stimulate and reward intellectual endeavours which contribute to public welfare. Prima facie, industrial inventions fall within the realm of patent protection, while literary and artistic works are the subject of copyright law. Software is atypical and its development pertains in part to "invention" and more particularly to "creation" as these terms are defined currently in Canada. Our review of the policy considerations which form the basis of each branch of intellectual property law will support this thesis.

2. Technical and Legal Obstacles to a Definitive Characterization of an Appropriate Legal Right

We embark upon conjugation of legal rights attaching to computer software at a time when the technological, commercial

and legal implications of this commodity have not yet fully evolved.

2.1 The Technology is Evolving

In practice, a program is tailored to suit the machine circuitry. The software market is linked with the market for computer hardware. Machinery dictates many formal aspects of software. For one thing, a program can only run on a brand of hardware which has "compatible" circuitry. For another, programs must be constantly updated to suit the hardware. The rate of technological evolution has left many jurists unfamiliar with hardware and software. Our legal framework is static in comparison with the rate at which technology is changing. In all likelihood, the legal rules attaching proprietary rights to software will trail the evolution of hardware technology.

2.2 The Law is Evolving

Computers are part of a larger context of technology which presents difficulties for students of intellectual property law who insist upon compartmentalizing its respective branches. As technology scuffles with traditional parameters, the various branches of intellectual property law must continue to provide protection for objects which were unknown to the drafters of intellectual property legislation.

3. Legal Protection of Information

The common law accords protection to ideas in very limited circumstances. The information sought to be protected must have been disclosed in confidence to be characterized as a trade secret.* Criminal law sanctions for misappropriation of confidential information of a commercial nature are in force in many parts of the United States.

It is only in specific instances that criminal prosecution is expressly associated with piracy of incorporeals. One case in point is section 287 of the Code which penalizes theft of telecommunication signals. This provision splits carrier from content. On its face, the section does not expressly refer to the information which is the substance of the communication. However, its effect is clearly to protect interception of private communications, and therefore of the information contained therein.

The Canadian Criminal Code does not explicitly state that misappropriation of software constitutes an offence. A recent decision of the Ontario Court of Appeal, R. v. Stewart (1) focuses squarely upon the issue of whether confidential information constitutes property which is within the purview of the Criminal Code. Leave to appeal has been granted by the Supreme Court of Canada and a decision by this Court upholding a conviction for counselling theft of incorporeal property

would have significant impact upon the protection of confidential information.

International response to the regulation of illicit trafficking in computer software has not been uniform. It is perhaps unduly optimistic to forecast the acceptance of a standard code of behaviour. Proposals have been formulated which speak to the elements which found a cause of action, proof of infringement, and enforcement of remedies. The inextricable interaction of states in modern times calls for a coordinated legal approach to the issue of software piracy. The rights of foreign developers must be balanced against those of the domestic industry.

4. Telecommunication of Computer Software

Protection of software is no longer a domestic issue. The marriage of computers with communication systems has fostered an environment for transborder data flow. It is expected to increase.

An Ottawa company, Nabu Network promoted the transmission of computer programs by cable. The company developed a service combining computer and cable television technology. Viewers can access a network of information, education and entertainment software. The subscriber paid an installation fee for an unscrambling device which was similar to the one which is used

by pay-TV. There was an additional monthly service charge. The Nabu system sent out software on an ongoing basis. The receiving unit accepted the software which it required in order to function as a personal computer.

The company planned to innovate satellite transmission which would allow smaller cable companies to participate in the system at minimal cost. The establishment of a worldwide telecommunications network has promoted the growth of an international commercial phenomenon.

5. Practical Solutions

Misappropriation of computer software occurs on two main levels. The most damaging situation is where a program developer departs from one place of employment, taking along expertise which was imparted in confidence. The mobile employee divulges years of research and development to a competitor. A second situation involves user misappropriation. This generally occurs because users discover that it is much less expensive to copy the program than to purchase the authentic version.

Industrial policing is the most effective route to protection of computer programs. One response to piracy must be the growth of software associations since it is rare that the individual software developer enjoys the resources to test what legal remedies are available. Clarification of the remedies,

although useful, may not be sufficient for the software developer is rarely in the financial position to enforce specific remedies. By contrast, interest groups enjoy the necessary leverage to finance such enforcement.

Software protection advocates have called for legislative reform. Legislation which is simply tied to the current technology may be in danger of becoming outdated by the rapidity of technological change. Dissemination of information is of some advantage to the programmer despite the absence of legislative protection, since remuneration attaches to use.

Costly programs will continue to include control mechanisms, along the lines of encryption. Software will diminish in price as the market for home computers increases. The paperback industry is an appropriate model for comparison. The industry has solved the problem of reprography because increased demand has corresponded with reduction in price. The incentive to infringe by illicit reproduction has been removed.

6. Conclusion : Legal Principles

The argument which follows analyzes the misappropriation of software as infringement of patent law, copyright and design law, and the law of trade secrets. Each branch of the law must serve to protect a particular attribute of computer software.

The well-being of an information-based economy makes legal recognition of the fact that data should not be subject to private appropriation all the more imperative. The rationale for compensating the programmer by way of a proprietary right is the public interest in the advancement of technology. To do so, the rights of the "developer" must be balanced against those of the user.

1. (1983) 42 O.R. (2d) 225 (O.C.A.)

DEFINITION OF TERMS

1. The History of Record-Keeping Devices

The utility of computer software rests in its capacity to enable the hardware to store and retrieve vast quantities of information. The significance of information and the need for efficient means of organizing and recording information were appreciated long before the advent of the modern computer. Historically we have relied upon different forms of record-keeping devices.

Primitive techniques of recording information made use of rocks, pebbles and notches on a stick. The rise of an economy based on currency demanded greater sophistication. The abacus was developed in China circa 2600 B.C. The Romans had a numeric system of their own to record amounts. Computations were performed upon counting boards. Roman numerals were replaced by Arabic numerals when the need arose for increased commercial sophistication.

Methods of record keeping which parallel the operations performed by computer are generally linked to the automatic weaving machine developed by Joseph Marie Jacquard (1752-1834). The function of his invention was to copy the pattern used in rugs. His use of punched cards influenced the development of the earliest representation of the present day computer.

The analytic engine was developed by Babbage (1791-1871), and consisted of a mechanical arrangement of gears and levers. Its capacity extended to storing data and to performing automatic computations at a very slow pace. Data was transferred from the storage unit to a mill. A separate device was necessary to accept data at the 'input' stage and one to deliver the answer as 'output'. The design of the machine closely resembled the modern computer in terms of input and output devices.

Further advances in electronics and manufacturing technology created the environment for the present day computer. A system to tabulate data was developed by adapting Jacquard's punched cards to represent numbers rather than weaving instructions. Electronic means were introduced to accelerate the pace of information processing. Holes were punched onto cards and metal pins penetrated these holes to contact a metal surface. This allowed an electric current to flow through a wire to a position on the card which designated a numerical or data equivalent. This system was implemented to tabulate data for the United States Census Bureau during the 1950's..

2. The History of Computer Hardware

There have been three generations of electronic computers to date. The first generation spanned the 1950's. These

machines were distinguished by the presence of an electronic or vacuum tube.

The second generation of computers was characterized by the use of transistors. These machines dominated the 1960's. Transistors are smaller, faster, and less expensive than electronic tubes. Their accuracy and speed led to the innovation of various methods of computer exploitation including operating systems and time-sharing. Most important to the emergence of a software industry was the development of user-oriented languages, symbols which represent the sequence of instructions which directs the operation of the computer.

The greatest electronic advances were made after 1965. This generation of computers is characterized by the large scale integrated device. Computers increased their speed of operation, becoming more compact, and even less expensive. Breakthroughs in solid state electronics led to the growth of the single-purpose microcomputer.

Computers are used in business, education, and the home. Complex programs are written for large scale, "mainframe" computers. Smaller business machines are known as "mini" computers. The newly burgeoning home computer division of the industry produces "micro" computers. Video games which are marketed for home computer use have accounted for much of their initial popularity.

3. A Description of Computer Hardware

The ~~central~~ processing unit is the brain of the computer. It is the location in which arithmetic and logical functions are executed. The operator can enter data into the computer by using a keyboard. A cathode ray tube terminal is attached to the computer. This device enables the computer to visually display to the operator the information which has been inserted.

The program is stored in the memory of the computer. A conduit connects the main memory to the central processing unit. Memory is comprised of a series of magnetic or electronic devices which are grouped in binary code representing bits of information. These are grouped further into larger units, known as bytes. Characters and words are composed of bytes.

4. Computer Software

The manufacture of hardware has spawned a second industry, which is concerned with developing software, the set of instructions which control the machine.

4.1 Uses

There are two types of software, application programs and system software. Application programs are written by the programmer to solve a specific problem. By contrast, system software supports the actual internal workings of the computer as a machine. For example, spooling software, utility programs and data base managers belong to the latter category. Both types of software involve comparable development and maintenance costs; designing, coding, testing and debugging. The heart of the program, or the "algorithm" is written out as a set of instructions. The errors are removed. The program is tested to ensure that a realistic representation of data is processed to accord with user expectations. Thereafter the software may be continually revised by the author to account for new input structure.

4.2 Machine Language

Binary and binary coded decimal notation are the languages which can be processed by a computer. "Machine language" is the form in which the individual characters of data are transferred between the computer and the input and output devices. It also permits storage of the individual characters in the memory of the computer. The language is stored in media which can be used

by the machine.

There are currently two popular computer codes. International Business Machines (IBM) employs the Extended Binary Coded Decimal Interchange Code (EBCDIC). The American Standards Bureau (ASCII) has devised an eight bit code. Most codes are standardized in length to achieve uniformity within the hardware industry.

Machine language is also known as object code. These terms are fitting because they connote a degree of remoteness from human comprehension. Machine language is not totally beyond the human senses since a computer can produce a printed copy of object code. The highly-skilled programmer can decipher the cryptic combination of 0's and 1's which comprise this language.

4.3 Source Languages

High-level languages are written in source code. It resembles spoken words, and is user "friendly", or more readily readable by humans. Source programs can be categorized in terms of their complexity.

The simplest type of source code is machine-oriented and is called Assembler. It resembles machine language. The second type is procedure-oriented. It is more complex. It is system

independent, which allows the program to run on any brand of hardware which is compatible. Three of the most popular procedure-oriented languages are FORTRAN, BASIC and COBOL. The third type of source language is problem-oriented. The rules of grammar are derived from the problem which is designated for computer resolution. The advantage of such a language is that fewer statements are needed to represent the algorithm.

5. Firmware

The program can be stored as software or as firmware. The practical distinction lies in the ease with which the program can be altered and pirated. Firmware is the bridge between software and hardware.

Software is stored on cassette or disk. There are also computer magazines listing the instructions which a layman can input into Random Access Memory (RAM). In this format, the program is easily alterable. Programs such as "Locksmith" and "Apple Nibbler" are designed to copy any commercial disk. Software stored on disk is especially vulnerable to piracy.

Alternatively, the program can be crystallized as firmware. A silicon chip is incorporated into computer circuitry as Read Only Memory (ROM). One type of ROM may be purchased which allows alteration of the silicon chip once only. It is called Programmable Read Only Memory, (PROM). A third type of ROM is the Erasable Programmable Read Only Memory.

(EPROM): The EPROM provides a mechanism whereby the user can remove the silicon chip, erase the pattern and replace it with a different configuration. Read Only Memory can be easily copied unless the chip is surrounded by physical means of protection.

One important industrial response to the protection of computer software has been to focus on its form of delivery. The average layman finds it simpler to copy a cassette or disk than to remove the ROM from one machine and build identical circuitry. The increased tendency of software houses to market the program on a ROM has succeeded in blurring the line between hardware and software. Jurists must somehow characterize this new phenomenon called firmware. It represents an artistic or literary work in a form which pertains to the law of inventions. The bridge between patent and copyright protection of software and firmware remains obscure because the law dwells upon form rather than purpose of development.

6. The Substance of the Program

6.1. Algorithm

The heart of a program is the algorithm. It is the set of instructions which execute the information which is stored in the computer. An algorithm is like a recipe because it is a non-numerical method of performing a task.

Formulation of the definition has juridical significance as ideas cannot be copyrighted nor principles patented. If we characterize the computer program as a form of expression which is defined by the ideas, we have concluded against copyright and patent protection. Once we determine that the designer of the circuitry embedded in the ROM chip had utilitarian, rather than artistic intentions, we have concluded against protection under Canadian industrial design legislation.

Proponents of intellectual property protection for software contend that the program is original, within the meaning ascribed by the copyright law, at the very least in terms of the written expression of the details of the algorithm. Patent law would offer some protection if the algorithm is inextricable from a patentable process or product. The latter description adopts a holistic view, that software and hardware constitute an invention.

6.2. Flowchart

The flowchart is a map of the program. Its function is to document, in visual format, the algorithm which is implemented by the software. Its form is written. It is an abstraction of the program, and at the same time, a realization of the algorithm. It is feasible to modify the algorithm so that it appears that the program has been created independently. This would not inhibit use of the program to solve a problem. Many

software houses are reluctant to divulge the algorithm in their attempts to secure the program.

Software developers are generally in agreement that an effective means of preventing the unauthorized modification of the program is to withhold basic documentation. From a legal standpoint, such an act may constitute a presumption that the material is confidential in nature, and subject to protection as a trade secret. This practical industrial response is a short term solution to guarding against piracy. Indeed, it may be antithetical to a policy which regards access to information as essential to technological advancement and public welfare.

Conclusion

The future will bring rapid technological change. Jurists must be alert to features of microprocessing which are now in process. An eclectic approach is necessary to adapt traditional substantive and remedial legal concepts to a technological phenomenon which is singular in its commercial impact.

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STATUTORY PROTECTION
OF PROPERTY

1. The Interested Parties

Development of a program requires a large financial investment even if its commercial success is short-lived. The initial costs are substantial, whether the software is written in one of a number of high level languages which are developed to execute complex operations, or whether the program is comprised of shorter functions such as is found in the video game. In either case, the parties which have a financial interest would include the programmer, the manufacturer and the distributor. No one in this chain is prepared to countenance acts of piracy whereby the program can be duplicated within a matter of seconds. Accordingly, all will resort to practical and legal measures to safeguard their product.

2. The Legal Concept of Property

The common law cherishes the right of every man to life, liberty and property. Various civil writs have developed which allow the aggrieved person to recover the property which has been misappropriated. Similarly, the criminal law prohibits acts in breach of the peace.

Use of the word "property" prior to the eighteenth century denoted corporeality. All objects of commercial value in

medieval England were tangible. The phrases "intellectual" and "industrial" property were coined in the seventeenth century, when limited recognition was paid to the concept of intangible property. In Canada, statutory protection of intellectual property is set out in the Patent Act (1) the Copyright Act (2) and the Industrial Design Act (3). The term "intellectual property" is misleading to the extent that it implies that ideas can be property. It is the transformation of ideas into property which is protected. The embodiment of the idea may take the form of a patent; a literary, artistic or musical work; or an industrial design.

We are moving toward a society in which the most important resources are not corporeal. (4)

"Property" is today essentially concerned with relations between persons, and the analogy with tangible things is quite misleading.....The older conception of property -..... (is) limited to rights enforceable against an indefinite number of third parties, such as the rights and interests a man has in land and chattels to the exclusion of others.....
Property is today best understood in terms of relational equities: property rights are the sanctioned behavioural relations among men that arise from the existence of goods and pertain to their use.....

To a limited extent, the definition of property in terms of equitable rights between parties conforms to the common law of confidentiality. This branch of the law protects information and the remedy provided is a personal right rather than a right

in rem.

The chapters which follow are concerned with intellectual property and the extent of statutory and common law protection of methods. The public interest in stimulating technological development is common to all branches of intellectual property law.

FOOTNOTES

1. R.S.C. 1970, c. P-4.
2. R.S.C. 1970, c. C-30.
3. R.S.C. 1970, c. I-8.
4. R.G. Hammond, "Quantum Physics, Econometric Models and Property Rights to Information" (1979) 27 McGill Law Journal 47 at pp. 50-53.

INVENTION

1. Principles of Patent Law

The Canadian Patent Act (1) provides the inventor with an exclusive monopoly for a period of seventeen years (2). To secure this grant, the inventor or his assignee must file an application in the Patent Office. The Canadian system is based on a "first to invent" procedure. This is clear from section 45 of the Act. Conflict proceedings are instituted where more than one application is received for the same invention. In a case of conflict, the Examiner will award the patent on the basis of first inventorship. Application is a mandatory filing procedure. By way of contrast, copyright arises inherently upon creation.

The patent agent, upon instructions from the inventor, will draw up the specification and claims. The specification describes how the invention works. The claims define the parameters of the invention. They must be drafted broadly enough to encompass the entire invention but they cannot be drafted too broadly, for that would be to claim more than has been invented. Claims must be construed as a whole to ascertain whether they conform to the three requirements of patentability: novelty, utility and inventiveness. This is

consistent with the philosophy behind the Act: to reward the inventor for his labour and expenses, and to persuade him and others to contribute to advance technology.

2. Policy

Patent legislation can be traced to the seventeenth century. The Statute of Monopolies (3) declared monopolies to be void as against the public interest. There was an exception made in the case of invention. A particular type of monopoly, known as a patent, was granted to an inventor, provided that the invention was not contrary to public order. Patents were granted for any manner of new manufactures not contrary to the law nor mischievous to the state. The term "manufacture" was explained in Boulton v. Bull (4) as follows:

It was admitted in the argument at the bar, that the word 'manufacture' in the statute was of extensive signification, that it applied not only to things made, but to the practice of making, to principles carried into practice in a new manner, to new results of principles carried into practice.... Under things made we may class in the first place, new compositions of things, such as manufactures in the most ordinary sense of the word; secondly, all mechanical inventions,..... for a new piece of mechanism is certainly a thing made. Under the practice of making we may class all new artificial manners of operating with the hand, or with instruments in common use, new processes in any art, producing effects useful to the public.

A patent would not be granted if to do so would be

injurious to trade. This provision was retained in S. 28(3) of the Canadian Patent Act which states that

No patent shall issue for an invention that has an illicit object in view....

The Canadian Act also allows the Commissioner of Patents to issue a compulsory licence to circumscribe the monopoly. S. 67 of the Act sets out six situations which constitute abuse by the holder of the patent. An application for a licence can be brought after three years from the date of the patent.

A further statutory restriction on the scope of the patent is set out in S. 41 of the Act. This section pertains to patents for chemical products and to substances intended for food or medicine. The substance must be claimed in conjunction with its method or process of manufacture. A scheme of compulsory licensing is set out in S. 41(3) whereby the Commissioner determines the amount of royalties payable to the inventor, by considering

the desirability of making the food or medicine available to the public at the lowest possible price consistent with giving to the inventor due reward for the research leading to the invention.

A claim which consists of unpatentable material will be struck from the patent application. A claim is too broad if it recites a scientific or abstract theorem (5) since theorems form part of the public domain. Claims to computer software per

se as well as computer implemented processes characteristically incorporate mathematical algorithms. Algorithms per se are unpatentable. Patentability is determined by assessing whether the novelty contained in a patent application consists solely of the program's algorithm. It is arguable that a program has no novel "output". We will examine the legal implications for the patentability of software and its relative, firmware. (6)

3. Hardware v. Software

A machine which is novel, useful, and unobvious can be patented. Section 2 of the Canadian Patent Act reads as follows:

Invention means any new and useful art, process, machine, manufacture or any new and useful improvement in any art, process, machine, manufacture or composition of matter.

Therefore, computer machinery, or "hardware" is patentable. It would seem that hardware is also distinguishable from software in terms of the nature of the property: only the former is tangible. (7) Some aspects of software are tangible. The distinction between hardware and software is more substantial. Processes are patentable, although neither directly tangible nor static in character. This is set out in S. 2 of the Act.

In the case of Tennessee Eastman Co. et al. v. Commissioner of Patents (8) the Supreme Court of Canada stated that "art" and "process", terms which appear in S. 2(d), are

circumscribed by the language of S. 28(3) and by the Design Act and the Copyright Act.

4.1 Software: Algorithm v. Process

An algorithm is a series of steps to solve a problem. At first glance, the definition could also apply to describe the term "process". However, the latter can be identified by its chemical or physical elements which interact to produce a physical reality. (9) This was recognized in O'Reilly v. Morse (10). The inventor could patent a process which used electromagnetism to produce distinguishable signs for telegraphy, but not electromagnetism, however developed for marking or printing intelligible characters or signs. This case was cited with approval in Gottschalk v. Benson (11) where the Supreme Court of the United States stated:

A principle in the abstract is a fundamental truth; an original cause; a motive; these cannot be patented, as no one can claim in either of them an exclusive right.... Phenomena of nature, thought just discovered, mental processes, and abstract intellectual concepts are not patentable, as they are the basic tools of scientific and technological work.

The mathematical formula was found to have no substantial practical application except in connection with a digital computer. In such circumstances, the effect of granting a patent for the program would be to pre-empt the algorithm.

4.2. Mental Steps

A doctrine was developed in the United States during the last decade, which denied protection to any process which could also be performed without mechanical aid. It is called the "mental steps" doctrine. It flows from the concern of patent law with practical embodiments, and the principle that ideas cannot be patented. The Examiner would analyze each claim to determine whether its novelty resided in an algorithm which could also be performed in the mind. An affirmative finding would defeat a patent. The test presumes that all steps in a process must be physical acts applied to physical objects. (12) The Patent Office has ceased to apply this test as the sole criterion of patentability. (13)

The principles discussed above illustrate the need to draft claims which emphasize the physical embodiment, hence the practical application of the invention. The jurisprudence relating to the patentability of software is reconcilable when viewed in this light.

5. Jurisprudence

5.1 Early Principle : Universal v. Special Purpose Machine

5.1.1. Canada

One of the earliest cases in Canada concerning computer

programs was a decision of the Patent Appeal Board, Re Application No. 961,392. (14) The applicant submitted that he had obtained a new machine by causing the computer to operate in a hitherto unknown manner. The Commissioner defined the issue to be whether the computer becomes a new machine when programmed to operate in a novel and useful fashion. Two types of claim were allowed:

- 1) claims for methods of controlling the operation of a data processor or for conditioning the operation of a data processor and
- 2) claims for a data processor controlled or conditioned to operate in accordance with a defined program.

The Board was prepared to allow a patent for a computer as an invention "deemed to be a machine which is different from the same computer when programmed in another way or unprogrammed."

(15) The Board also stated that claims to "a set of ordered steps or list of instructions specifying the internal changes of a state of physical devices within a data processor" could not be patented as a programme. (16)

The term programme is taken to mean a set of ordered steps or lists of instructions specifying the internal changes of state or physical devices, within a data processor. This set of steps or lists of instructions may be recorded on a variety of handwritten lists on paper, punched cards or paper tapes, magnetic tapes or electric wiring. No matter what form or device is used to record a programme, it is not patentable as a programme. This is the conclusion that has been reached in many countries and I find no reason for the Patent Office to hold a different view. (17)

The Patent Appeal Board considered whether a computer that is

programmed in another way. (18) The distinction between "universal" and "special purpose" machinery first enunciated in the British case of Slee and Harris's Application (19) was accepted in Canada, when the Commissioner stated that decisions of the British and American courts are authoritative in Canada. (20)

The evolution of the relevant jurisprudence in these two countries is significant because of the international nature of the software industry.

5.1.2. British Jurisprudence

A claim for "a computer having slow and quick access storage, when programmed to solve a linear programming problem", was held patentable in Slee and Harris's Application. The invention was characterized as a machine which had been temporarily modified. The following explanation was given (21):

The means claimed is more than a record of the program, it is an integer which physically co-operates with a computer to control the latter to operate in a certain way. The means can, therefore be likened to a cam shaped according to certain formulae so that, when fixed into a machine it controls the latter in a certain way.

The Patent Office rejected a claim for a method of operating a computer since the product was intellectual information, and

not a vendible product.

Another British case cited with approval in Waldbaum (22) was Gever's Application. (23) It concerned a method of preparing a trade mark index using punched cards. The claims were redrafted for presentation before the Patent Appeal Tribunal to include an apparatus which was constrained to function in a certain way. Graham, J. in the Appeal Tribunal cited Boulton and Watt v. Bull (24) and found that the invention was patentable as a "manufacture" within S. 101 of the Patent Act. The Tribunal held further that a punched card is analogous to a cam. When placed in a machine, the result is novel, useful and inventive. Therefore the invention is no less patentable than "a new type of carburettor which is accessory to the motor car for which it is intended." A punched card is ancillary to the machine since it is not intended to communicate information to the human eye. (25)

The British Patent Act was amended in 1977 to expressly exclude patent protection for computer programs. This was necessary because Britain is a party to the European Patent Convention, which provides in Art. 52 par. 2 that software is not patentable. Furthermore, the relevance of British jurisprudence has been brought into question by the Supreme Court of Canada in the important case of Tennessee Eastman Company. (26) Pigeon, J. stated

I doubt whether decisions dealing with the patentability of inventions under

the U.K. Act are entitled in Canada to the weight authors such as Fox (Canadian Law and Practice Relating to Letters Patent, 4th ed. p. 19) seem to think they should have. There are substantial differences between the British and Canadian statutes which need not be enumerated. (27)

5.1.3. American Jurisprudence

The history and social policy of the Canadian Act can be more readily likened to the American Patent Act than to British legislation. The text of S. 28 of the Canadian Patent Act is comparable to the apparent purport of 35 U.S.C. 101. The early U.S. cases retain the same distinction between general and specific machines common to early Canadian and British jurisprudence. In the case of In re Bernhart (28) the Court of Customs and Patent Appeals stated as follows:

(I) If a machine is programmed in a certain new and unobvious way it is physically different from the machine without that program; its memory elements are differently arranged. The fact that these physical changes are invisible to the eye should not tempt us to conclude that the machine has not been changed. If a new machine has not been invented, certainly a 'new and useful improvement' of the unprogrammed machine has been, and Congress has said in 35 U.S.C. 101 that such improvements are statutory subject matter for a patent. (29)

In Gottschalk v. Benson, (30) the United States Supreme Court rejected an application for a patent whose claims extended to a monopoly for a mathematical formula. The court did not, however, rule out the patentability of computer

programs per se. The "nutshell" principle (31) which has been deduced from the case is the following:

It is conceded that one may not patent an idea. But in practical effect that would be the result if the formula for converting BCD numerals to pure binary numerals were patented in this case. The mathematical formula involved here has no substantial practical application except in connection with a digital computer, which means that if the judgment below is affirmed the patent would wholly pre-empt the mathematical formula and in practical effect would be a patent on the algorithm itself.

The court stated the characteristics of a process patent to be the "transformation and reduction of an article to a different state or thing." (32)

6. The Product of the Invention

The product of the process must not be a pure number. Parker v. Flook (33) is another decision in which the U.S. Supreme Court rejected method claims employing a mathematical algorithm to control the rate of a chemical conversion process executed by computer. The court affirmed that algorithms belong in the public domain. The argument that the claims do not wholly pre-empt the mathematical formula if there are additional uses remaining in the public domain, was rejected. Post-solution activity whereby the algorithm interacts with a tangible substance, is not sufficient to confer patentability. (34) The Court stated that some programs may be patentable as processes, provided that there is some inventive concept other

than the algorithm in the application. (35) The case has been criticized on the grounds that the inventiveness inherent in a computer program consists exclusively of the algorithm. The execution will always be routine because the apparatus is inevitably the standard computer. (36)

A process which enhances the operation of a computer is patentable. In the contemporary decision of In re McIlroy (37) the Court of Customs and Patent Appeals relied upon its finding in Benson for the proposition that "a process having no practical value other than enhancing the internal operations of (digital) computers) was in the technological or useful arts and hence was statutory under S. 101." The claims defining a method for retrieving symbolic data were held to be patentable.

7. Two Guides to Ascertaining Patentability

The approach to ascertaining whether a machine is patentable involves two steps. It was enunciated in In re Freeman, (38) and modified partially in In re Walter. (39) The claim is examined to determine the significance of the algorithm. (40) The claim must implement the algorithm in a specific manner to define structural relationships between the apparatus claims, or define physical process steps. To this end, the claim is analyzed as a whole.

In Walter, the Court insisted upon analysis of the claim

as a whole, to determine whether it is merely directed to the solution of a mathematical algorithm.

For instance, if the end product of a claimed invention is a pure number, as in *Benson and Flook*, the invention is non-statutory, regardless of any post-solution activity which makes it available for use by a person or machine for other purposes. If, however, the claimed invention produces a physical thing,..... the fact of representation in numerical form does not render the claim nonstatutory. (41)

Two cases came before the Supreme Court of the United States in 1981. In *Diamond v. Diehr* (42) a patent was granted upon an application for a computer-aided method of operating a rubber-moulding press. A digital computer was used to calculate the duration of cure-time which is essential to the process. The court found a process, constituting an invention extending beyond the algorithm. Upholding the Court of Customs and Patent Appeals by a majority of 5:4, the court stated:

when a claim containing a mathematical formula implements or applies that formula in a structure or process which, when considered as a whole, is performing a function which the patent laws were designed to protect, (e.g. transforming or reducing an article to a different state or thing) then the claim satisfies the requirement of S. 101. (43)

Thus, a process which satisfies the requirements of inventiveness, novelty and utility is patentable despite the fact that it is serviced by a digital computer.

The case of Diamond v. Bradley (44) decided by an equally split U.S. Supreme Court granting a patent for apparatus claims which involved calculations. The invention was found to consist of a combination of tangible hardware elements, including some firmware. This case indicates that even the express presence of a mathematical algorithm in the claims will not negative patentability. This proposition was confirmed by the D.C.P.A. in the case of In re Pardo. (45) A patent was granted for an invention which transformed the internal operations of the computer. The invention interpreted high level languages in object code and compiled them into machine language for execution by a computer. Similarly, a method of seismic exploration was held by the D.C.P.A. to be patentable in the case of In re Taner. (46) The process effected conversion of signals into a 'form representing the earth's response to cylindrical or planar waves.' Markey, C.J. held as irrelevant the fact that the "physical apparitions" could also be represented by mathematical formulae.

B. Conclusion : Directions in the Federal Court of Canada

Many uncertainties linger regarding characterization of the invention. The courts must determine whether the essence of the invention is the algorithm or another element which connotes inventive ingenuity. In other words, once the algorithm is stripped away, the courts must determine whether the remainder is properly the subject of patent protection.

These issues are not foreign to the Federal Court of Canada, despite the paucity of decisions regarding patentability of computer software. In Schlumberger v. Commissioner of Patents (47) the Federal Court affirmed the Patent Appeal Board's confirmation of the Examiner's rejection of a process to analyze data. The process was based on a computer program designed to assess the availability of hydrocarbons in shaly sand formations. Pratte, J. was not influenced by the absence of algorithmic expression in the claims. He stated

what is new here is the discovery of various calculations to be made and of the mathematical formulae to be used in making these calculations. If those calculations were not to be effected by computers but by men, the subject-matter of the application would clearly be mathematical formulae and a series of purely mental operations; as such, in my view, it would not be patentable. (48)

The remarks of the learned justice herald the pre-eminence of substance over form. He went on to turn the mental steps doctrine on its head, by stating,

(T)he fact that a computer is or should be used to implement discovery does not change the nature of that discovery. (49)

We have seen the abandonment of the mental steps doctrine. The fact that the mind is used does not, of itself, negate patentability. Similarly, the fact that a computer is used does not, of itself, confer patentability. It is at this juncture that American and Canadian jurisprudence converge. The heart of the issue is characterization of

the invention.

FOOTNOTES

1. R.S.C. 1970, c. P-4.
2. S. 48.
3. 21 Jac. 1, c. 3 S.6, 1624 Chitty's Eng. Stat., 6th ed.
4. (1795) 2 Hy. Bl. 463 at p. 492.
5. S. 28(3).
6. In re Bradley (1979) 600 F. 2d 807 (C.C.P.A. 1979) at 810 f.n 3 :
"Firmware is a term of art in the computer field and refers to
'microinstructions permanently embedded in hardware elements.....We
need not and do not decide at this time whether firmware per se is
statutory under 35 U.S.C. 101 because the invention as a whole is not
directed thereto.'
7. R. Barrigan, "Legal Protection of Software from Unauthorized Use:
Proprietary and Contractual Rights" (1976) 30 C.P.R. (2d) 159 at p.
161.
8. [1974] S.C.R. 111. This case concerned a patent application for a
method of surgical bonding. The court construed S. 41 and held that
therapeutic use cannot be claimed apart from the substance itself.
9. G. Green, "Software is unpatentable, but....." (1982) April
Industrial Research and Development 29.
10. 15 How. 62, 14 L Ed 601.
11. 409 U.S. 63 at p. 67 (S.Ct. 1972).
12. In re Musgrave 431 F. 2d 882 at p. 893 (C.C.P.A. 1970)
13. In re Johnson 589 F. 2d 1070 at p. 1079 (C.C.P.A. 1978)
14. (1972) 5 C.P.R. (2d) 163 (Patent Office). This case is also
referred to as the Waldbaum application.
15. Ibid., at p. 169.

16. Ibid., at p. 165.
17. Ibid.
18. Ibid., at p. 166.
19. [1966] R.P.C. 194 (Patent Office).
20. supra, at p. 168 but see *infra* note 27.
21. supra, note 19 at p. 198.
22. supra, note 14.
23. [1970] R.P.C. 91 (Appeal Tribunal).
24. supra, note 3.
25. supra, note 23 at p. 98.
26. supra, note 8.
27. Ibid., at p. 120, further citing Estey, J. in Commissioner of Patents v. Winthrop Chemical Co. Inc. [1948] S.C.R. 46 at p. 49: ".....the Canadian Act is not modelled on the British Act."
28. 417 F. 2d 1395, 163 U.S.P.D. 611 (C.C.P.A. 1969).
29. Ibid., at p. 1400.
30. supra, note 11.
31. Ibid. at p. 71. This principle was cited and applied in In re Freeman 573 F. 2d 1237, 197 U.S.P.O. 464 (C.C.P.A. 1978), In re Richman 563 F. 2d 1026, 195 U.S.P.O. 340 (C.C.P.A. 1977), In re Castelet 562 F. 2d 1236, 195 U.S.P.O. 439 (C.C.P.A. 1977), In re Chatfield 545 F. 2d 152, 191 U.S.P.O. 730 (C.C.P.A. 1976) cert. denied 434 U.S. 875, 195 U.S.P.O. 465 (1977) at p. 70.
32. Ibid. at p. 70.
33. 437 U.S. 584 (Supr. Ct. 1978).
34. Ibid., at p. 590.
35. Ibid., at p. 594.

36. J. Myrick and J. Sprowl, "New and possibly patentable machines, methods, and organisms can result when instructions are fed into universal machines." (1982) A.B.A.J. 920.

37. 442 F. 2d 1397 (C.C.P.A. 1971) at p. 1398.

38. 573 F. 2d 1237 (C.C.P.A. 1978).

39. 618 F. 2d 758, 205 U.S.P.Q. 397 (C.C.P.A. 1980).

40. Ibid., at p. 767.

41. Ibid., at p. 768.

42. 450 U.S. 175 (Supr. Ct. 1981).

43. Ibid., at p. 192.

44. 450 U.S. 381 (Supr. Ct. 1981).

45. 684 F. 2d 912, 214 U.S.P.Q. 673 (C.C.P.A. 1982).

46. 681 F. 2d 787, 214 U.S.P.Q. 678 (C.C.P.A. 1982).

47. Schlumberger v. Commissioner of Patents (1981) 56 C.P.R. (2d) 204 (F.C.A.).

48. Ibid., at p. 206.

49. Ibid.

INDUSTRIAL DESIGNS

The computer ROM is comprised of electronic circuitry which relays information. It is a three-dimensional silicon chip, minuscule in size. Plastic works which are relative to science are included within the scope of protection extended by the Canadian Copyright Act to "every original literary, dramatic, musical and artistic work". (1)

Section 46(1) of the Canadian Copyright Act combines with Rule 11 of the Industrial Design Act. (2) The effect is that copyright protection is unavailable, although it would otherwise subsist, in an artistic work which is intended for use as a model or pattern to be multiplied more than fifty times by an industrial process. Copyright and industrial design are mutually exclusive forms of protection according to Canadian law. (3)

A design which is utilitarian rather than ornamental is not capable of protection under the Industrial Design Act. In Gandy v. The Commissioner (4) Mahoney, J. approved the definition of design enunciated by Jackett, P. in Dimon and Tiengo v. Bench Made Furniture Corp. and Edwards (5)

The sort of design that can be registered is therefore a design to be "applied" to "the ornamenting" of an article. It must therefore be something that determines the appearance of an article, or some part of an article, because ornamenting relates to appearance. And it must have as its objective making the appearance of an article more attractive because that is the purpose of ornamenting. It cannot be something that determines the nature of an article as such (as opposed to mere appearance) and it cannot be something that determines how an article is to be created. In other words it cannot create a monopoly in "a product" or "a process" such as can be acquired by patent for invention.

S. 1 of the British Registered Designs Act provides that the features of an industrial design cannot be dictated solely by function. In Amp Inc. v. Utilex Proprietary Ltd. (6) the House of Lords stated that a design must have eye appeal, and denied protection to designs for a single electric terminal and to a number of terminals joined together.

The British Copyright Act was amended in 1968 to permit the co-existence of copyright and design protection. The effect has been to inhibit competition among the manufacturers of a purely utilitarian object. The standards of protection are more lenient in respect of design copyright than for the grant of a patent.

Reproduction in three dimensions of a two-dimensional

copyrighted work constitutes infringement in Great Britain. S. 3(1) of the English Copyright Act of 1956 protects artistic works, irrespective of artistic quality

namely paintings, sculptures, drawings, engravings and photographs.

This section has had a severe impact on the auto parts industry. One example is provided by the case of British Leyland Motor Corporation v. Armstrong Patents. (7) The defendants were held liable of infringing the plaintiff's copyright in drawings of exhaust pipes by manufacturing the parts so described. The court stated that an infringement of drawings is not limited to reproduction of the drawings in two dimensions. The defendant did not contest that the exhaust pipes would appear to a non-expert as a reproduction of the drawings. This is a requirement, in accordance with S. 9(8).

In Canada, the term of protection for industrial designs is shorter than that provided by copyright legislation. The design must be registered before it is published. There is no reported case of an attempt to enforce a proprietary right to software based on industrial design legislation.

To claim protection, the designer of the chip must establish that the pattern of electronic circuitry was not selected for purely utilitarian purposes. It is not likely that the author of the source program could be characterized as the industrial designer of the ROM chip, since this developer has

usually not envisaged the layout of the electronic circuitry.

However, such protection could be claimed by the designer who ultimately determines the ornamentation of the pattern which is applied to the silicon chip.

FOOTNOTES

1. R.S.C. 1970, c. C-30 S.2.

2. R.S.C. 1970, c. I-8.

3. e.g. Eldon Industries Inc. v. Reliable Toy Co. (1965) 44 C.P.R. 255 (O.S.C.), Cimon v. Berich Made Furniture Corporation (1965) 48 C.P.R. 31 at p. 34 (Ex.).

4. (1980) 47 C.P.R. (2d) 109 (F.)

5. (1964) 48 C.P.R. 31 at p. 50. (Ex.)

6. [1972] R.P.C. 103 (H.L.)

7. [1982] F.S.R. 481 (Ch.).

EXPRESSION

1. General Principles of Canadian Copyright Law

The Canadian Copyright Act affords protection for the original expression of ideas in artistic or literary form.

Section 3 defines the ambit of literary works to include "maps, charts, plans, tables and compilations." That section provides that infringement occurs by reproduction and publication of the copyright expression. The actual use of the underlying idea is noticeably absent from this list of prohibited behaviour. For example, it would be an infringing act to copy a recipe, but not to bake the cake. This is because copyright extends to the expression, and not to the underlying ideas. (1)

The term of protection is related to the nature of the

work. (2). As a general rule, copyright endures for a minimum of fifty years after the death of the author.

2. Policy

Canadian legislation does not impose formal requirements to secure copyright. For example, registration is not mandatory. On the other hand, the scope of protection is narrower than what is afforded by the Patent Act. Common to both Acts is the absence of protection for pure ideas. In contrast to the monopoly which a patent confers, the Copyright Act permits independent creation stemming from a common source.

The policy context surrounding the grant of this particular form of protection has been defined by the Department of Consumer and Corporate Affairs (Canada) in the following manner:

The primary justification for copyright is the conviction that encouraging individual literary and artistic effort by personal gain is the best way to promote public welfare....by conferring a limited monopoly (it) is intended to encourage authors to write and publish by removing the fear of plagiarism. Hence the individual author or artist will be ensured of being adequately compensated for his or her efforts while society will benefit through publication of the work. (3)

In large measure these considerations echo the interests underlying patent legislation. One major difference between the

two Acts is the standard of originality. The Copyright Act imposes a less stringent test than the "novelty" which must be established to obtain a patent. Originality is demonstrated by a distinguishable variation from older works. (4)

The Canadian reports by A. Keyes and C. Brunet (5) and Dr. Palmer (6) acknowledge the advantage of awarding an intellectual proprietary right toward the dissemination of information. However, a particularly important characteristic of the Canadian context is the position of Canada as a "net importer of technology". (7) We suffer a deficit of homegrown copyright material. If most copyright royalties are earned by non-Canadians, the cost of misallocation of resources and monopoly profits are burdensome to Canadians. Nor can Canada legislate to discriminate between nationals and non-nationals without breaching her treaty obligations under the Berne (8) and Universal Copyright (9) Conventions. These studies emphasize that stiffer copyright legislation must be justified by a strong software industry.

Software developers argue that strong legislative protection would foster the environment for this industry to flourish. It requires comparatively little initial capital investment but a high level of education. Canada could become a competitive exporter. Copyright protection for computer software must be unequivocal if Canada is to reap the benefits of reciprocity in the arena of international trade.

3. An Historical Review of Copyright

A survey of copyright jurisprudence reveals the extent to which this branch of property law has been modified over time. Originally, copyright legislation did indeed focus upon ideas, since it was associated with censorship by the monarch. (10) The English Court of Star Chamber established the Stationers' Company to issue publishing permits and remunerate worthy authors. This arrangement allowed the Crown to exercise control over the content of literary works. The Stationers' Company held a monopoly from 1556-1594, and continued to pass by-laws even after this period.

The role of censorship was less emphasized during the reign of Queen Anne. Pursuant to "An Act for the encouragement of Learning by Vesting the Copies of printed Books in the Authors or Purchasers of Such Copies, during the Times therein mentioned" (11) authors who registered their works with the Company were protected against unauthorized duplication for fourteen years. In the case of unpublished works, the common law provided the author with an alternative to statutory protection as of 1769. (12)

With the development of the printing press the focus of copyright centred upon expression, rather than content. (13) This change in focus has remained with modern copyright

legislation. It would not now be socially acceptable for the legislator to use copyright as a weapon of censorship. To prevent this, copyright must be restricted to protect original forms of expression, regardless of the underlying idea. As a corollary, no one can monopolize the idea. In the context of computer programs, the idea is the algorithm.

4. Idea v. Expression

The software developer who seeks to maintain copyright must establish that the program is a particular expression of an idea, rather than an attempt to monopolize the idea itself.

When idea and expression coincide, there will be protection against nothing other than identical copying of the work....(T)he scope of protection increases with the extent expression differs from the idea....The idea and the expression will coincide when the expression provides nothing new or additional over the idea. (14)

The rationale is that ideas are the "common heritage of mankind". An expression cannot be copyrighted if the idea can only be expressed in one form. This has led some jurists to posit that copyright should not be extended to computer programs.

If there is only one useful way of setting out the program, then it is difficult to justify the work as one in which copyright should subsist. The reason is that if copyright were alleged to subsist in the program, it would apparently have the effect of protecting the idea (viz. the information content of the algorithm)

rather than its expression. That result is contrary to the law of copyright. (15)

As authority for this proposition, the case of Cuisenaire v. South West Imports (16) is cited. The Supreme Court of Canada held that there is no copyright in a set of coloured rods. The coloured wooden sticks are aids to teach arithmetic in elementary schools. Each stick represents a number of units. The court characterized the work as purely functional. Despite the bright colours, the rods were devoid of artistic merit. The case shows the difficulty in determining the dividing line between ideas and their expression.

The earliest formation of this test is to be found in the case of Baker v. Selden (17) where it was held that blank forms which organize data are not copyrightable. The object was a method of accounting. The court did not find expression beyond the data which was organized by the blank forms. Another example of the dichotomy between ideas and expression is found in the case of Morrissey v. Proctor and Gamble Co. (18) A set of contest rules was refused registration of copyright, since there was a finite number of ways to express the idea. Monopolization of the sum of possible forms of expression would effectively remove the idea from the public domain. The U.S. Copyright Act withholds protection from any

idea, procedure, process, system, method of operation, concept, principle or discovery, regardless of the form in which it is described, explained, illustrated, or embodied (19)

This issue has assumed relevance with respect to copyright protection of software. In the case of Synercom Technology Inc. v. University Computing Co. (20) the plaintiff claimed infringement of his copyright in instruction manuals and input formats used to solve engineering problems incident to the calculation of structures. The manuals were held to be the subject of copyright. The issue was whether the defendant had relied upon the idea or expression when copying the formats. The court characterized the formats as a method of selecting and arranging data, analogous to the accounting forms at issue in Baker v. Selden. Hence, no copyright protection was extended to the plaintiffs. This holding is all the more striking in light of the defendants' admission that they had copied the formats.

The Canadian Copyright Act protects particular forms of expression. (21) An application to enjoin reproduction of accounting forms brought the issue of copyright in compilations before the Federal Court of Canada in the case of The Bulman Group v. Alpha One-Write Systems B.C. Ltd. (22) The application was refused in the trial division. Addy, J. held that since the forms did not convey information they were clearly not "literary works". The Court of Appeal allowed the injunction on the basis that an arguable case for protection had been made at the interlocutory stage. Sufficient labour and skill had been expended to bring the forms within the heading of literary works. In the recent case of International Business Machines v.

Spirales Computers, (23) Madame Justice Reed granted an injunction to restrain the unauthorized reproduction of a program in source and object code. She rejected the argument that the idea and expression had merged, since various programs could be written to perform the same function.

5. Audiovisual works

The initial success of the market for popular software is largely attributable to the video game. Some arcade games have enjoyed remarkable success. Many games have a very short life-span. In Midway Mfg. Co. v. Bandai-America (24) the court recognized that damage resulting from infringement may be irreparable "as the game may fade from the scene before the final rights of the parties are adjudicated." The volume of sales renders the damage all the more striking.

Elements of the game are two-fold: the musical sounds which are emitted, and the images which are projected onto the screen in the arcade or on the home computer during both the "attract" and the "play" modes. Musical sounds have rarely (25) formed the subject of copyright actions. This is not surprising in light of the fact that there is neither melody nor harmony to protect. Other characteristics of musical composition, such as rhythmic groupings and phrase structure, are absent. The visual elements include shapes, sizes, colours, sequences, and arrangements. The courts pay close scrutiny to detail in ascertaining whether a work is sufficiently original to merit

copyright protection.

Video games, unlike an artist's painting or even other audiovisual works, appeal to an audience that is fairly indiscriminating insofar as their concern about more subtle differences in artistic expression. (26)

In Midway (27) the court recognized that "(a) player caught up in the heat of a video battle would tend to overlook many minor differences between the games." (28)

Section 3(1)(e) of the Canadian Copyright Act grants protection to audiovisual, or "cinematographic" works. The issue of "fixation" of motion is important to consider. It was central to the decision of the Exchequer Court in Canadian Admiral Corporation Ltd. v. Rediffusion. (29) Cameron, J. stated: (30)

(F)or copyright to subsist in a "work" it must be expressed to some extent at least in some material form, capable of identification and having a more or less permanent endurance.

He did not find a permanent record of the football game, and held that the image on the screen was merely fleeting. There was thus no fixation suitable for copyright protection.

The images which are flashed upon the screen are controlled to some extent by the player who operates a joystick or paddles. All possible combinations are predetermined by the programmer and manipulations of a computer are never random.

Nevertheless, the program is not fixed in the same way that a melody is fixed when stored on cassette. Each execution of the program is unique.

A second obstacle to copyright protection involves isolating the element of expression from the underlying idea. The fundamental criterion respecting copyright in video games is the extent to which the technology dictates the details of the game.

Video games have received protection in Canada solely by way of interlocutory orders. (31) The issue is settled in the United States. "It is unquestionable that video games in general are entitled to copyright protection as audio-visual works." (32) The variety of possible game sequences offered to the player does not detract from fixation of the sounds and images which are stored on the circuit board of the machine. (33).

The Court of Appeals for the Third Circuit ruled in Williams Electronics v. Arctic International (34) that the test of fixation is met where the audiovisual work is permanently stored in the memory devices of the computer. The pre-requisite is whether the work is "sufficiently permanent or stable" such as to permit communication for more than a transitory period. Sloviter, J. ruled that the terms "fixation" and "copy" should be broadly construed so as to accord with technological advances and to avoid the "unlimited loophole" which would

result by limiting the protection for computer programs to the text, and exclude duplication of the program which is fixed on the chip. Williams was decided under the 1980 amendment to the American Copyright Act which affirmed protection for computer programs, specifically.

The court cited Stern Electronics v. Kaufman (35) for the proposition that the player is not the co-author of the game. The sights and sounds of the game and many other aspects recur from one game to the next, regardless of the player's moves.

Users of home computers commonly exchange disks. The issue of home taping was considered by the Supreme Court of the United States in Sony v. Universal Studios (36). The court split 5-4 in favour of the legality of home taping and held that videotape recording of copyrighted television programs falls within the exemption of "fair use" provided in S. 107 of the Copyright Act of 1976. The manufacturer of tapes was not held to be a contributory infringer. Videotape recorders (VTRs) are commonly used to record the televised program for viewing at a more convenient time. This is advantageous to the copyright owners since the facility offers the prospect of a larger audience. Other acquirers use the VTR to avoid purchasing the television programs. This reduces the royalties which would otherwise be payable to the copyright owners.

The court held that the manufacturer of a facility which is designed to facilitate unauthorized duplication of copyright

material is not a contributory infringer. The imposition of liability based upon constructive knowledge was rejected. Had the court held otherwise, it could have been argued by analogy that the manufacturer of a disk drive, or a blank tape, or a program to decode protected software has constructive knowledge that some purchasers intend to use the product to reproduce copyrighted software. A finding of liability would sterilize the market.

The rights of the owner of copyright in a computer program are subject to 17 U.S.C. 117. This exemption to copyright permits the purchaser of a program to make or authorize the making of another copy or adaptation of the program provided

(2) that such new copy or adaptation is for archival purposes only and that all archival copies are destroyed in the event that continued possession of the computer program should cease to be rightful.

In Canada, the exemption for "fair dealing" is narrower than the American exemption for "fair use". Section 17(2)(a) of the Canadian Copyright Act provides an exception which is based upon "fair dealing." The section provides that

(a) any fair dealing
with any work for the purposes of private study;
research, criticism, review or newspaper summary;

would not constitute infringement of copyright.

Mass distribution of software, whether gratuitously or

for profit, detracts from the potential royalties of the copyright owner. The exception provided in the United States for "fair use" is broader than the Canadian exception for "fair dealing".

6. Literary Works

Computer programs are not mentioned expressly in the Canadian Act. Our copyright legislation has not been revised materially since its adoption in 1924. In the absence of a trial decision regarding copyrightability of software in Canada, it must be determined whether flow charts, printouts, and the expression of the instructions which constitute the program are proper subject matter for copyright. Two recent interlocutory decisions have classified computer programs as literary works: Apple Computer v. Computermat (37) and Dynabec Ltd. v. Societe D'Informatique R.D.G. Inc. et al. (38).

As a general rule the purpose of copyright is to protect aesthetic forms of expression. There is a number of cases where copyright has been extended to functional works. Mathematical tables (39) and railway timetables have (40) received protection as literary works. The information was presented in an original fashion. The arrangement was designed to simplify. These cases are also cited in support of the proposition that one of the purposes of copyright legislation is to reward labour which has given rise to commercial value. Lack of protection leads to static inefficiency and induces the

creator to direct all efforts toward protecting the innovation from unauthorized use.

Proponents of copyrightability of software would argue that the category of literary works is broad enough to encompass computer programs, either by analogy to "tables" or because the definition is not restrictive in nature.

In the United States, copyrightability of computer programs can be traced to the 1976 revision of the Copyright Act. The definition of "literary work" was expanded to include works

expressed in words, numbers, or other verbal or numerical symbols or indicia, regardless of the nature of the material objects, such as tapes, disks or cards, in which they are embedded. (41)

The House Report states that programs are protected "to the extent that they incorporate authorship in the programmer's expression of original ideas, as distinguished from the ideas themselves." The Computer Software Protection Act became part of U.S. copyright law in 1981. Specific reference is made to computer programs. (42)

7. Reproduction of a Protected Work in Another Form

5. 3(1)(a) gives the author the exclusive right to reproduce his work in its entirety or in any substantial part. Support for copyrightability of object code would rely upon the

preamble of S. 3(1) which states

For the purposes of this Act, "copyright" means the sole right to produce or reproduce the work or any substantial part thereof in any material form whatever....

It is argued that the source program is copyrightable as a literary work, since it is a writing. Object code would be seen as a "translation" of the source code into machine language.

Object code can be stored in a memory device such as a ROM semiconductor "chip" (integrated circuit) which is plugged into a circuit board. A silicon chip is a three dimensional object. S. 3(1)(d) applies to "literary works". This provision awards the copyright owner protection of his work in any "contrivance by which the work may be mechanically performed or delivered." In our survey of the relevant jurisprudence, object code is examined both in terms of its relation to the source program, and as a separate work.

In the United States, it is recognized that infringement can occur between works created in different media. (43) This does not prove that the object program embedded in ROM is a copy of the source program. In Data Cash Systems v. JS&A Group (44) the object phase of a program was held to be beyond the scope of copyrightable material. Plaintiff's computer chess game, embodied in ROM, was copied by the defendant with impunity. The court stated (45) that a computer program becomes embedded in material form and becomes a mechanical device. It

was precisely this characterization of ROM as mechanical which led to the conclusion against copyright. Machines are not properly the subject of copyright protection. The court rejected the argument that ROM is a copy of the source program, and stated (46)

Both at common law and under the 1909 Act, a "copy" must be in a form which others can see and read.....a copy of a computer program is another computer program in its flow chart or source phase, because these are comparable technical writings. While the ROM is the mechanical embodiment of the source program, it is not a copy of it.

On appeal, the Seventh Circuit held that the plaintiff had failed to include a copyright notice on the CompuChess device, under the erroneous belief that a printout could not be produced from ROM. (47) The plaintiff was again denied copyright protection, because the mandatory notice requirements were not satisfied. The court was bound by the Act of 1909 since the infringement occurred prior to 1976.

Data Cash was the subject of attention in Tandy v. Personal Micro Computers (48) where the District Court of California held that a program in object code is copyrightable under 17 U.S.C. 101, insofar as a silicon chip is a tangible medium of expression within the statute. Section 102(a) provides that works can be "fixed" in

any tangible medium of expression, now known or later developed, from which they can be perceived, reproduced or otherwise communicated, either directly or with the aid of a machine or device.

The court held that ROM falls easily within this definition. It was not necessary to determine whether a ROM chip was a "copy" within the definition stated in the case of White-Smith Music Co. v. Apollo Co. (49) On the facts, it was likely that the chip had been copied by examining the program on the video display terminal and then imprinting the software on a chip. The court disapproved of the reasoning of the lower Court decision in Data Cash. The Seventh Circuit denied the motion to dismiss.

Copyrightability of object code was reiterated in the case of Apple Computer v. Franklin Computer Corp. (50) The U.S. Court of Appeals held that a computer program is a literary work. Both the source language and object code embedded on the ROM chip are subject to copyright protection. The Court enjoined the sale of computer programs in object code, stored in ROM in the defendant's Apple compatible computer.

An injunction was granted upon similar facts in Apple Computer Inc. v. Formula International. (51) Hill, J. stated that all ROMS are copyrightable regardless of their "utilitarian" function.

Purely functional designs receive protection in Great Britain under both copyright and design legislation. Maps, charts and plans fall within the definition of "drawing" set out in S. 48(1) of the Copyright Act. These are protected by S.

3(1) of that Copyright Act as artistic rather than as literary works. In this sense, British legislation is distinguishable from the Canadian legislative framework.

S. 3(1)(a) of the British Copyright Act provides copyright in a drawing irrespective of the artistic quality. Sections 2(5) and 3(5) prohibit reproduction of an artistic work "in any material form". S. 48(1) defines "reproduction" to include conversion from two to three dimensions where the resemblance is obvious to the eye. The Copyright Act would offer protection to a program which is embedded in a three-dimensional ROM chip only if it is a visible reproduction of a two-dimensional copyrighted work.

There is a number of sections in the Canadian Act which allow for copyright protection of three dimensional objects. In particular, S. 2 relates to an "architectural work of art", to "artistic work", and to "every original.....artistic work", as well as S. 3 of the Copyright Act which defines copyright as "the sole right to produce or reproduce the work or any substantial part thereof in any material form whatever." The application of this section requires two assumptions: the source code can be protected as a literary work, and the ROM chip is a reproduction of the source code in another form.

S. 3 was reviewed by the Supreme Court of Canada with reference to musical works in the case of Compo Company Limited v. Blue Crest Music Inc. et al. (52) The defendant record

presser had not obtained the pre-requisite mechanical authorization, nor had a statutory licence been granted under S. 19. The copyright in the musical work was infringed when the defendant made records without right.

S. 3(1)(d) of the Act gives the owner of copyright in a "literary, dramatic or musical work" the right to make or authorize the making of a contrivance by which the work can be mechanically delivered. Copyright protection for computer programs could be supported by characterization of the source code as a literary work, and the ROM chip as a mechanical contrivance.

FOOTNOTES

1. Cuisenaire v. South West Imports [1969] S.C.R. 208.
2. R.S.C. 1970 c.C-30, s. 6.
3. A. Keyes and C. Brunet, Copyright in Canada (Ottawa: Consumer and Corporate Affairs, 1977).
4. supra, note 2.
5. supra, note 3.
6. J. Palmer and P. Resendes, Copyright and the Computer. (Ottawa: Consumer and Corporate Affairs Canada, 1982).
7. Ibid., at p. 87.
8. (1887) 91 Parl. Papers 297 (C. 5167). Canada has ratified the Rome text of the Berne Convention (1928).
9. 216 U.N.T.S. 132, ratified by Canada with effect from August 10, 1962.
10. R. Roberts, "Canadian Copyright: Natural Property or Mere Monopoly" (1979) 40 C.P.R. (2d) 33 at p. 36.
11. 1709, 8 Anne C. 19.
12. supra, note 10.

13. E. Seltzer, Exemptions and Fair Use Copyright. (Cambridge: Harvard University Press, 1978) at p. 4.

14. Sid & Marty Krofft Television Productions, Inc. v. McDonald's Corp., 562 F. 2d 1157, 1168, 196 U.S.P.Q. 97 (9th Cir. 1977) at pp. 105-106.

15. R. Barrigar, "Legal Protection of Software" (1977) 30 C.P.R. (2d) 159 at 164, but see I.B.M. v. Spiraes Computers (unrep.) June 27, 1984 (F.). Consent to permanent injunction filed before Pinard, J. March 7, 1985.

16. supra, note 1.

17. Baker v. Selden 101 U.S. 99, (Cir. Ct. Ohio, 1879) withholding copyright protection for an accounting method.

18. 379 F. 2d 675 (1st Cir. 1967).

19. 17 U.S.C. app 101-810 (1976). Semble, S. 902 (c) of the Semiconductor Chip Protection Act, 1984 Pub. L. 98-620.

20. 462 F. Supp. 1003 (N.D. Tex., 1978) and 474 F. Supp. 37 (N.D. Tex. 1979) on the issue of unfair competition.

21. (1980) 54 C.P.R. (2d) 171.

22. Ibid., at p. 179.

23. I.B.M. v. Spiraes Computers supra, note 15.

24. 216 U.S.P.Q. 814 (District Ct. N.J. 1983) at p. 833.

25. There is only one example : Ibid., at p. 831.

26. Atari v. North American Philips Consumer Electronics Corp. 672 F. 2d at 619, 214 U.S.P.Q. at 42-3. (7th Cir. 1982).

27. supra, note 23.

28. Ibid., at p. 829.

29. (1954) 20 C.P.R. 75 (Ex.).

30. at p. 86. See also New Boston Television Inc. v. Sports Programming Network Inc. 215 U.S.P.Q. 755 (N.D. Mass. 1981).

31. Bally Midway Manufacturing Co. v. Coinex Video Games (1983) 71 C.P.R. (2d) 105. See also Nintendo of America v. Coinex Video Games (1982) 69 C.P.R. (2d) 122.

32. Stern Electronics Inc. v. Kaufman 669 F. 2d 852, 856-7 (2d Cir. 1982). In Midway Manufacturing v. Strohon (1983) U.S.P.Q. 42 (N.D. Ill.) at p. 49 the court recognized expressly that the computer program copyright connected with the video game can be protected separately from the audiovisual copyright.

33. In re Certain Coin-Operated Audiovisual Games (1983) 218 U.S.P.Q. 925 (U.S. International Trade Commission).

34. 215 U.S.P.Q. 405 (3d Cir. 1982).

35. 669 F. 2d 213 U.S.P.Q. 444 (2d Cir. 1982).

36. (unrep.) January 17, 1984 (S. Ct.).

37. (1984) 75 C.P.R. (2d) 26 (O.H.C.) citing Spacefile v. Smart Computing Systems (1984) 75 C.P.R. (2d) 281 (O.H.C.).

38. (unrep.) April 4, 1985 (Que. C.A.) confirming (unrep.) August 14, 1984 (Que. S.C.).

39. Baily v. Taylor (1830) 1 Russ. & M 73.

40. Blacklock v. Pearson (1915) 2 Ch. 376.

41. 17 U.S.C. 101.

42. Pub. L. 96-517 Dec. 12, 1980, 94 Stat. 3028.

43. Atari v. North American Philips Consumer Electronics Corp. 672 F. 2d 607 (7th Cir. 1982) at 618 ; M. Nimmer, Nimmer on Copyright S. 8.01 (C) p. B.13 (1981).

44. 480 F.Supp. 1063 (N.D. Ill. 1979) affirmed on other grounds, 628 F. 2d 1038 (7th Cir. 1980).

45. Ibid., at p. 1065.

46. Ibid., at p. 1068.

47. 628 F. 2d 1038 (7th Circuit 1980).

48. supra, note 42.

49. 209 U.S. 1 (1908).

50. 714 F. 2d 1240 (3rd Cir. 1983).

51. 562 F. Supp. 775 (D.C. Calif. 1983) affirmed 725 F. 2d 521 (9th Cir. 1984). The District Court of California found Formula in contempt of this injunction on October 1, 1984.

52. Compo Company Limited v. Blue Crest Music Inc. et al. [1980] 1 S.C.R. 357.

COMMON LAW PROTECTION
OF IDEAS

2

1. Limited Protection of Ideas

The common law protects the originator of information who has taken precautions to ensure its confidentiality. The term "trade secret" refers to information which is unknown to the general public. The distinction between common knowledge and confidential information was made with reference to the computer industry in the case of Northern Office Micro Computers v. Rosenstein. (1) The idea of using a computer to program a system is not confidential. The particular way to solve the problem by means of the computer is a trade secret.

The significance of this type of legal protection is the manner in which it arises. The parties may expressly covenant to treat the information as a trade secret. In other circumstances the obligation of confidentiality may be implied because of the fiduciary nature of the relationship of the parties, or because of the circumstances surrounding disclosure.

The software developer has an idea as to how to solve a particular problem by using a computer. Remuneration is expected in return for disclosure of the idea. Great pains are taken to protect against misappropriation of this idea. Trade secret protection allows the programmer, and other parties along the chain of distribution, to obtain compensation. The

award may be coupled with an injunction to prevent further misappropriation.

2. Scope of Protection

Criteria for the identification of a trade secret were identified in the English case of Amber Size & Chemical Co. v. Menzel. (2)

Did the plaintiffs in fact possess and exercise a secret process? Did the Defendant acquire knowledge during his employment of such secret or a material part thereof? and if so, has he since leaving the Plaintiff's employ, made an improper use of the knowledge so acquired by him?

Trade secret protection is unlimited as to time. This is in contrast to the statutory law of patent, design and copyright. The significant drawback to reliance on the common law is evidentiary. The developer must establish that the program is a secret, although it may well have been communicated in whole or part to many segments of the public.

The law prohibits unauthorized exploitation of an idea imparted in confidence. This is commonly referred to as the "springboard" doctrine. The case of Talbot v. General Television Corporation (3) indicates that even a "kernel of a concept" can be protected. The plaintiff approached a television station with an idea for a series on wealthy public

personalities. The manager convinced the plaintiff to submit a pilot film. Talbot did not hear from the television station again, but learned from other sources that his theme had been used. The defendant argued that the station originated the idea independently. Citing Lord Denning's decision in Seager v. Copydex (4), the Supreme Court of Victoria held that even subconscious use of confidential information should be restrained.

3. Applicability to Computer Software

Unauthorized distribution of the programs would destroy the developer's head start in the market. The effect would be to render the employer's toil and investment worthless. The case of Northern Office Micro Computers v. Rosenstein (5) illustrates the significance of this area of the law to protect software.

The facts of the case are common to the software industry. The defendant was engaged to devise an accounting program for a group of doctors and dentists. (6) The issue was whether the purchaser of services could restrain the defendant copyright owner from revealing its details to other medical professionals. The court held that the program was a trade secret, and subject to restraint upon disclosure.

An employer's trade secret may be no more than the result of his own skill, knowledge and experience. But if the employee was engaged to

evolve the secret, it remains the employer's trade secret for all that. (7)

The obligation to observe trade secrecy prevents an employee from enjoying the attributes of ownership of copyright. Rights in a trade secret may override copyright. Canadian law would vest copyright in the person who commissioned the program, pursuant to S. 12 of the Copyright Act. The apportionment of rights to a trade secret and rights arising from copyright which were in issue in Northern Office Micro Computers would not ordinarily arise. The issue is relevant, however, due to S. 12(7) of the Act which recognizes a right existing apart from copyright to restrain distortion, mutilation or other modification.

Proponents of trade secret protection for computer software argue that the purchaser undertakes not to circulate the program. In Northern Office Micro Computers, the court based this obligation on the facts. The program was commissioned by the plaintiffs. Non-disclosure was an implied term of the contract.

The software house can rely upon a licensing contract to restrain the purchaser from copying and distributing the program. IBM requires that each purchaser of a program which is priced above one hundred dollars enter into a license agreement. This is evidence of the company's intention to maintain its characterization of the program as a trade secret.

Many programs which are vulnerable to piracy are standard packages. This software is generally licensed for use by one person, rather than sold. The outside wrapper states that the licensee is deemed to accept the conditions described inside the package.

It is unlikely that Canadian courts would imply an obligation of confidence between the manufacturer of standard software and the buyer. As a further drawback to software protection, the doctrine of privity precludes the institution of legal proceedings against unsuspecting third parties who make use of these programs.

4. The Mobile Employee

The obligation to maintain confidentiality is a fiduciary obligation which arises automatically because of the relationship between certain parties who enter into a relationship of trust. Loyalty, good faith and avoidance of a conflict between interest and duty are the bases for the obligation. The rule was stated in Boardman v. Phipps (8). The legitimate bounds of self-interest in a fiduciary context are not easily discernable. (9) The information need not be confidential to be the subject to a fiduciary duty. (10)

The obligation resting on the employee may be expressed in a restrictive covenant, or inferred from the conditions of employment. The validity of a restrictive covenant is subject to judicial scrutiny. A clause must be reasonable to be valid. The obligation of confidentiality should be no wider than necessary.

The obligation to maintain confidentiality must be reasonable. In Dunning & Elliot Ltd. v. Johnson and Firth Brown (11) Lord Denning accepted the power of the courts to review the agreements which had been concluded by the parties. He stated (12)

If the stipulation for confidence was unreasonable at the time of making it; or if it was reasonable at the beginning, but afterwards, in the course of subsequent happenings, it becomes unreasonable that it should be enforced: then the courts will decline to enforce it just as in the case of a covenant in restraint of trade.

The Master of the Rolls looked to the effect of the confidentiality covenant, and struck it down as unreasonable, in the sense of inequitable. It operated to the benefit of one group of shareholders at the expense of another.

The extent to which the employee's background should inure to the benefit of the employer is a vexing question, which was considered by the Ontario High Court in Polyresins v. Stein-Hall. (13) The defendants were chemists who had developed

a process while employed by the plaintiffs. The defendants entered the employment of a competitor, and proceeded to develop a product which was substantially similar to the plaintiff's trade secret. The court stated that an injunction is available to restrain the third party employer in good faith who receives the information which should not have been disclosed.

The nature of the defendant's conduct is considered by the courts. In the United States the law respecting trade secrets is codified and attaches penal sanctions. Canadian courts have not hesitated to use terminology such as, "the brazen theft of trade secrets". In Bee Chemical Co. v. Plastic Paint and Finish Ltd. (14) the Ontario Court of Appeal imposed a high standard of confidentiality upon the defendant who engages in a specialty business. The court granted a permanent injunction restraining the disclosure of trade secrets. The injunction also provided for enforcement of a restrictive covenant for three years. Arnpup, J.A. stated that a specialty business requires more than the usual degree of protection.

It is in the public interest to enable the employee to contribute acquired skills to the furtherance of technology. The employee must not be deprived of the capacity to earn a living. The court in Northern Office Micro Computers stated:

(It does not follow from this that the respondent may not again apply his mind to the development of a suite

of programs to cater to the accounting profession or that if he does, he must wipe clean the slate of his memory (as if it were possible) any recollection he may have of the things which it seemed to him were appropriate for the inclusion in such a suite of programs, of appropriate formulae or the like. (15)

A similar holding was reached in Canada in the recent case of Canavest House Limited v. Lett (16). An investment corporation successfully restrained a software designer from reproducing or using software which had been developed during the course of the defendant's employment. The defendant had resisted every attempt by the employer to sign a restrictive covenant. Mr. Justice Callon stated that the applicant for an interlocutory injunction must establish a strong prima facie case where the outcome would impinge upon the defendant's right to earn a livelihood. The court granted an injunction restraining the defendant and any person having knowledge of the order, from copying, reproducing the software, or otherwise infringing copyright in the program. In addition, the defendant was forbidden to disclose information concerning the software to any person.

The application for an order to deliver up the research notes was denied. Callon, J. likened the programmer's research notes to the carpenter's hammer and saw. S. 17(2) of the Copyright Act is an exemption to copyright in artistic works. It was relied upon to permit the developer to use the research materials so long as he refrained from reproducing the work itself.

A contract between the originator of the idea and the party to whom the confidence is expressed should outline specifically what information must be kept secret. In Searle v. Celltech (17) it was held that an employer who seeks to restrain an ex-employee from using certain information must identify the alleged trade secret. The plaintiff must explain why the circumstances surrounding the disclosure require that the information be impressed with the obligation of confidentiality.

A very real question is the extent to which the courts will be influenced by the current trend to facilitate access to information. The issue is relevant when the restrictions imposed do not clearly arise within the context of fiduciary relationships. This is the case of the programmer who is salaried by day and earns supplementary income by freelancing.

5. Application of Common Law Principles in Quebec

The common law decisions discussed above are equally representative of the state of the law in Quebec. The case of Platt v. Lange Canada (18) concerned the issue of unfair competition. The defendant manufactured a unique type of hinged boot which originated with the plaintiff. The Court of Appeal held that there was no misappropriation of the plaintiff's idea, since the defendants had used their skill and expertise toward experimentation and the boot had been improved. The

English authorities on the springboard doctrine were cited with approval.

Article 1053 of the Civil Code provides a second basis to seek damages in Quebec. It reads as follows:

Art. 1053. Every person capable of discerning right from wrong is responsible for the damage caused by his fault to another, whether by positive act, imprudence, neglect or want of skill.

Restrictive covenants whereby the employee of the purchaser agrees not to use the software unfairly would fall within article 1065.

Art. 1065. Every obligation renders the debtor liable in damages in case of a breach of it on his part. The creditor may, in cases which admit of it, demand also a specific performance of the obligation, and that he be authorized to execute it at the debtor's expense, or that the contract from which the obligation arises be set aside; subject to the special provisions contained in this Code, and without prejudice, in either case, to his claim for damages.

Restitution of moneys obtained by way of undue enrichment provides an alternate recourse.

6. Conclusion : A Limited Scope of Protection

It is sometimes argued that the most effective means of protecting software is by characterizing the algorithm as a trade secret. This is valid in relation to software which is custom tailored to suit the particular purchaser. The primary limitation on this source of protection is the fact that it does not prohibit reverse engineering. Provided that the purchaser is not a restrictive covenantee, he is free to take apart the program and put it back together. Related to this issue is the case of the program which is sold off the shelf and intended for the public at large. It is highly unlikely that the material which is distributed to the public calls for the cloak of secrecy.

FOOTNOTES

1. [1982] F.S.R. 124 (S.A.).
2. [1913] 30 R.P.C. 433 (Ch.) at p. 441. The U.S. Restatement of Torts S 757, comment b (1939) identifies three properties of a trade secret : novelty, secrecy, and value in the business of the putative trade secret owner.
3. [1981] R.P.C. 1 (S.C. Vict.) at p. 10.
4. [1967] 2 All E.R. 415 (Ch.)
5. supra, note 1.
6. The contract "for services", vested copyright in the program developer. This is in contrast to the more classic master-servant relationship whereby it is the employer who has entered into a contract of service or apprenticeship receives ownership of the copyright: S. 12(3) Copyright Act R.S.C. 1970.
7. Ibid., at p. 127.
8. [1967] 2 A.C. 46 (H.L.)
9. D. Waters, Law of Trusts in Canada. Toronto : Carswell, 1974 at p. 347.
10. Canadian Aero Services v. O'Malley [1974] S.C.R. 592.
11. [1978] F.S.R. 143 (Ch.).
12. Ibid., at p. 148.

13. [1972] 2 O.R. 188.

14. (1980) 47 C.P.R. (2d) 133 (O.C.A.) at p. 134.

15. supra, note 1.

16. November 29, 1984, Toronto Motions Court (unrep.).

17. [1982] F.S.R. 92 (C.A.).

18. (1975) 18 C.P.R. (2d) 144 (Que. C.A.) overturning (1973) 9 C.P.R. (2d) 231 (Que. S.C.)

• Evidence of Infringement and Anton Piller Orders

A programmer whose works are pirated faces the very difficult task of amassing evidence. A tape can be copied in a matter of seconds; incriminating evidence of piracy can be erased as quickly. A bootlegger who learns of the institution of infringement proceedings can immediately erase the disks housing the infringing programs.

Evidentiary concerns often determine whether a case will stand up in court. The new technology is symptomatic of this problem since it allows the defendant to remove, within minutes, the very evidence upon which the case is based. A legal solution has been devised. It is a procedural weapon which is broad in scope. It is awarded before the main action is instituted, and before our courts have determined whether piracy of software violates any substantive legal right.

1. Nature of the Order

The English Court of Appeal has developed a pre-emptive security technique (1) to speak to the technological ease of erasing evidence. It is called the Anton Piller order. (2) The inherent jurisdiction of the court is the legal basis for the award.

Most often, an order satisfies the applicant's need to

incriminate a third party infringer of a proprietary right (e.g. a manufacturer or supplier of materials) by ordering the defendant to deliver up information. (3) The defendant may be the only person in a position to identify the third party.

The order is made almost exclusively in the area of intellectual property. Prima facie, the applicant is the holder of a proprietary right. Alternatively, a right of action can arise from a penal statute. (4)

Lord Denning enunciated the following criteria in the Anton Piller case. The claimant proceeds by way of ex parte application, before the writ is issued. Strong evidence of a prima facie case and serious actual or potential damage must be adduced. Evidence should be brought to show that if the defendant were forewarned he would likely destroy the evidence in his possession.

The Piller case arose upon an allegation of copyright infringement. Having satisfied the requirements set out above, the plaintiff was granted the order. Its scope permitted the applicant, accompanied by his solicitor, to enter the defendant's premises and to identify, inspect, and remove relevant evidence. This would usually include invoices, infringing plates and other articles which could be used to violate the applicant's proprietary interest. The order is in sharp contrast to the pre-trial discovery process and the subpoena duces tecum, where the onus rests upon the defendant.

to produce the incriminating evidence.

The order must be worded in a precise fashion. (5) Under exceptional circumstances the court will order a general warrant. The order is served by the plaintiff's solicitor or patent agent (6) upon the defendant or any other "apparently responsible person." (7)

2. Civil v. Criminal

Lord Denning created a bit of fiction to distinguish the Piller order from a criminal search warrant : the defendant is persuaded to consent to the search. The order

does not authorise the plaintiff's solicitor or anyone else to enter the defendant's premises against their will. It does not authorise the breaking down of doors, nor the slipping in by the back door, nor getting in by any open door or window. But it does do this : it brings pressure on the defendants to give permission. It does more - it actually orders them to give permission - with, I suppose, the result that if they do not give permission, they are guilty of contempt of court. (8)

The defendant who refuses to allow the order to be executed can apply, by way of application inter partes, to have the order discharged as having been improperly obtained. If this is granted, the defendant is retroactively cured of contempt. (9) After the court determines whether the injunction should continue, the defendant has a right to claim damages

under the cross-undertaking. (10)

The device has been described as draconian, (11) in that it allows for trespass to property and invasion of privacy. It is usually (12) assumed that the defendant will act in bad faith. In Ex Parte Island Records (13) the defendants were bootleggers who sold records without paying the requisite royalty to the Performing Rights Association. The plaintiffs proceeded successfully under the Dramatic and Musical Performers' Protection Act 1958 (14) to demonstrate special damage over and above that suffered by the general public. Shaw, L.J. delivered a vigorous dissent in which he expressed fear that the consequences which flow from the award of a Piller Order are harsher than the criminal law. He stated (15)

It is not unimportant to remember that a search warrant could not be obtained in a criminal court where a person is suspected of offences under the section.....

(If the order were made) the civil remedy said to arise collaterally from a penal provision would go beyond what the criminal law permits in the enforcement of that provision. It is not in my view the function of the courts indirectly to stiffen the sinews of a criminal statute.

The law of evidence confirms his remarks. Once the evidence has been introduced into civil proceedings, the courts are obliged to give it consideration. "The judge cannot refuse it on the ground that it may have been unlawfully obtained in the beginning." (16) In the case of International Electronics Ltd. v. Weigh Data (17) Graham, J. refused to retry a case

where an Anton Piller order had been granted requiring disclosure of incriminating evidence. The learned justice relied upon the well-known principle enunciated in Kuruma v. R. (18)

If it is (relevant), it is admissible and the court is not concerned with how it was obtained.

This principle has been sharply attenuated in Canada by the Charter of Rights (19). S.8 provides the right to be secure against unreasonable search and seizure. S. 24(2) reads as follows:

Where a court concludes that evidence was obtained in a manner that infringed or denied any rights or freedoms guaranteed by this charter, the evidence shall be excluded if it is established that, having regard to all the circumstances, the admission of it in the proceedings would bring the administration of justice into disrepute.

The laws of England and Canada differ as to the availability of the privilege against self-incrimination. Section 72 of the Supreme Court Act of the United Kingdom (1981) expressly eliminates this privilege where intellectual property rights are the subject of civil proceedings. The question of self-incrimination arises in Canada because of the penal provisions in sections 25 and 26 of the Copyright Act. Addy, J. observed in the case of Chin-Can Communication Corporation v. Chinese Video Centre Ltd. (20) that

since the amendments to our constitution have now been proclaimed in force, a valid argument might well be made against any such general disclosure order being granted in the future, even where a general right to search by "Anton Piller" order is being allowed.

Mr. Justice Aday stated that a defendant should be notified prior to the issuance of a disclosure order.

Given the consequences of a Piller order, the defendant is protected by the following measures which are culled from the reported cases. Evidence of wrongdoing, which was the rationale for the order, should be attached to the order. (21) Service is effected by the plaintiff's solicitor, as an officer of the court. As a "neutral" party, the solicitor is charged with explaining the order to the astonished recipient. The scope of the inspection should be limited to the relief claimed in the main action. (22)

It is inevitable that the inspection will yield some information of a confidential nature. There is great danger of abuse, particularly where competitors "inadvertently" gain access to confidential trade secrets by means of this process. The defendant is advised to seek an undertaking that the information is retained by the sheriff or solicitor so that it remains inaccessible to the plaintiff. (23) Rule 455(2) of the Federal Court allows for the issuance of a protective order. (24) Another precaution is to seek an undertaking whereby the plaintiffs refrain from using the evidence in other

proceedings. (25) The Crown is not bound by this undertaking.

(26)

The Piller order has found its way into Canadian civil procedure. (27) The Supreme Court of Ontario could rely upon its inherent jurisdiction to award this equitable remedy. The Federal Court of Appeal has accepted the tests enunciated by Lord Denning, M.R. in Anton Piller (28) and issues the order although there is no case law in Canada at present beyond the interlocutory stage which establishes copyright protection for computer software. (29) The court justified this situation in The Bulgan Group Ltd. v. Alpha One-Write Systems B.C. Ltd. (30)

It has been held that an application for an interlocutory injunction is not the stage for determining difficult questions of law on which the merits of the case depend, and that where the other conditions for an interlocutory injunction are satisfied, it should not be refused if there is a serious question to be tried: American Cyanamid Co. v. Ethicon Ltd. [1975] R.P.C. 531 at p. 541.

FOOTNOTES

1. M. Dockray, "Liberty to Rummage-A Search Warrant in Civil Proceedings?" (1977) Public Law 369.
2. Anton Piller K.G. v. Manufacturing Processes Ltd. [1976] 1 Ch. 55.
3. Sony v. Time Electronics [1981] F.S.R. 398 (Ch.) at p. 402.
4. Ex Parte Island Records [1978] 3 All E.R. 824 (C.A.) disapproved in part in R.C.A. v. Pollard [1983] 1 Ch. 135 at p. 139.
5. Protector Alarms Ltd. v. Maxim Alarms Ltd. [1978] F.S.R. 442 (C.A.). The search extended throughout all of the defendant's headquarters based in England.
6. Universal Studios v. Mukhtar (1976) 2 All E.R. 330 (Ch.).
7. Gates v. Swift [1981] F.S.R. 57 (Ch.).
8. supra, note 2 at p. 60.
9. Hallmark Cards v. Image Arts [1977] F.S.R. 150 (C.A.) at p. 153.
10. Fletcher Sutcliffe Wild Ltd. v. Burch [1982] F.S.R. 64 (C.A.) at p. 68.
11. EMI v. Pandit (1975) 1 W.L.R. 302 (C.A.).
12. c.f. contra Universal City Studios Inc. v. Mukhtar and Sons [1976] 2 All E.R. 342 (C.A.).
13. [1978] 3 All E.R. 824 (C.A.).
14. 6&7 Eliz. 2, c. 44. Section 1 prescribed a criminal penalty.
15. supra, note 13 at p. 834.

16. Helliwell v. Piggott Sims [1980] F.S.R. 356 (C.A.) at p. 357.
17. [1980] F.S.R. 423 (Ch.).
18. Kuruma v. R. [1955] A.C. 197 at p. 203.
19. as enacted by the Canada Act, 1982, c. 11 (U.K.).
20. (1983) 70 C.P.R. (2d) 184 at p. 189 (F.)
21. supra, note 17.
22. EMI Australia v. Bay Imports [1980] F.S.R. 328 (C.A.).
23. Nintendo of America v. Coinex Video Games Inc. et al. (1982) 69 C.P.R. (2d) 122. The order issued gave custody of the materials to the sheriff.
24. Foesco International v. Bimac Canada (1978) 51 C.P.R. (2d) 51 (F.).
25. supra, note 7.
26. Rank Film Distributors Ltd. v. Video Information Centre (1980) 2 All E.R. 273 (C.A.), affirmed (1981) 2 All E.R. 76 (H.L.).
27. inter alia, Bardeau v. Crown Food Services Equipment Ltd. (1983) 66 C.P.R. (2d) 183 (O.H.C.).
28. supra, note 24.
29. S. 20(3)(a) of the Copyright Act provides that, in any action in which the defendant puts the existence of copyright in issue, the work is presumed to be a work in which copyright subsists.
30. (1980) 54 C.P.R. (2d) 179 at p. 182. (F.C.A.).

PENAL SANCTIONS

1. Penal Sanctions: Plan of Analysis

There are two approaches to the relationship of software piracy and the criminal law. The first focuses upon the acquisition of property. The scope of the term "property" is in issue. The second analysis is concerned with the interception of private communications. The conduct of the parties is in issue.

1.1 Origins of the Criminal Law and the Association of Property with Corporeality

The origins of the criminal law can be traced to the Roman Tables. They provide us with little historical information as to the types of conduct which were prohibited. The Romans were primarily concerned with recording the details of punishment. (1)

It was not until the development of the early common law that legal discussion concerned the nature of conduct which should be subject to criminal sanction. This society attached primary commercial importance to land, or "real property". Its protection was secured by recourse to the civil law. The criminal law dealt exclusively with "chattels". (2) Chattels are tangible, moveable, objects which are capable of being possessed. (3)

Canadian law respecting theft is modelled upon the English law. The Larceny Act 1869 (4) was based on the English

Larceny Act 1861. In 1892 a Criminal Code was adopted in Canada. It was based on a Draft Code commissioned by the English Parliament, on Stephen's Digest of Criminal Law and on Burbridge's Digest of Canadian Criminal Law (5).

As a general rule, modern criminal law relates to property which shares the characteristics of medieval chattels.

Things which are not the property of anyone, and a fortiori things which cannot be the subject of property, cannot be misappropriated fraudulently or otherwise. (6)

There can be no physical asportation of information. The party from whom the information was misappropriated is not permanently deprived, (7) since information is independent of a medium. None of the characteristics of "chattels" is present. It is an offence to break and enter a filing cabinet and to remove the documents which are contained inside. Many information storage systems are computerized due to the prevalence of this new technology. The commercial value of the stolen object is not the value of, for example, a blank disk, but what it represents as software. From a practical standpoint, it is inadequate to penalize asportation of the material support.

2.1. R. v. Stewart

The issue of criminal sanction for misappropriation of

incorporeal property came before the Ontario Court of Appeal in R. v. Stewart: (8) The facts of the case are as follows. The accused was seeking to unionize the employees of a Toronto hotel. He offered a sum to one employee who had access to payroll lists and computer printouts, in attempt to secure the names, addresses and telephone numbers of the employees at the hotel. The accused was charged with counselling the employee to procure the relevant lists: by copying the information without removing the physical documents.

The Court of first instance determined that misappropriation of confidential information is neither mischief to private property (9) nor theft (10) and held that an article must be a vendible object of commerce to fall within the provision of the Code respecting fraud. (11) On appeal, Lacourcière, J.A. dissenting agreed that the word "anything" should be interpreted restrictively to connote "property",

and thus confidential information, per se is not protected under the criminal code. (12)

The majority of the Court of Appeal gave a wide interpretation to the word "anything", and held that confidential information is property. The accused was held liable of counselling theft. The case is presently under appeal to the Supreme Court of Canada.

2.2 Mischief

S. 387(1)(c) of the Criminal Code states:

Every one commits mischief who wilfully
(c) obstructs, interrupts or interferes
with the lawful use, enjoyment or
operation of property.

S. 385 defines property for the purposes of Part IX:

In this Part, "property" means real
or personal corporeal property.

Interference with computer hardware, such as bringing down the system, would constitute an offence under this section.

On the facts of Stewart, the alleged property would have been made public by an employee, rather than the accused. There was no breach of confidentiality by the management. Furthermore, the Crown failed to prove that damage to the physical property of the hotel would ensue. The Crown did not appeal the acquittal of the accused at trial on this count.

In Re Turner and the Queen (13) concerned a charge of mischief in connection with the electronic alteration of data. Gray, J. held that the gist of S. 387 is not the physical alteration of property but the enjoyment of property. The application to quash the committal for trial was dismissed. This case is presently on appeal to the Ontario Court of

Appeal.

2.3 Theft

5. 283 (1) of the Criminal Code states

Every one commits theft who fraudulently and without colour of right takes, or fraudulently and without colour of right converts to his use or to the use of another person, anything whether animate or inanimate with intent,

a) to deprive, temporarily or absolutely, the owner of it or a person who has a special property or interest in it, of the thing or of his property or interest in it,

d) to deal with it in such a manner that it cannot be restored in the condition in which it was at the time it was taken or converted.

The offence of theft is derived from the common law of larceny. Physical dispossession and deprivation are the two essential elements of this offence. Larceny is an offence against possession which is characterized by taking, or asportation, with such violence as offends a threshold of criminality. (14)

It is not "theft" to take something which cannot be "stolen" in the eyes of the law. On the facts of Stewart, no physical property was removed. The High Court cited American jurisprudence which appears on the surface to identify property

with corporeality. Closer analysis demonstrates a trend toward greater flexibility on the part of U.S. courts in construing criminal legislation to accord with commercial reality. The Ontario Court of Appeal adopted this flexibility in Stewart. Houlden, J.A. stated: (15)

The last half of the twentieth century has seen an exponential growth in the development and improvement of methods of storing and distributing information. I believe that S. 283(1) of the Code is wide enough to protect the interests of those who compile and store such information and restrain the activities of those who wrongfully seek to misappropriate it.

Article 141B of Title 17, Chapter 8 of the Texas Penal Code resembles the Canadian Criminal Code in including "property" within the ambit of the provision on theft. It reads as follows:

The term 'property' as used in relation to the crime of theft includes....all writings of every description, provided such property possesses any ascertainable value.

The case of Hancock v. State of Texas (16) concerned the interpretation of this article. The facts are not unique within the context of software development. Hancock, an employee of Texas Instruments removed original documents containing computer programs. Hancock's mistake was in removing the originals. Asportation of the res was sufficient to allow the courts to resort to traditional concepts of theft. The case is thus distinguishable from Stewart on the facts. The court in Hancock looked to the commercial value of the software to find

that the programs exceeded the minimum value for prosecution under this section, being fifty dollars.

Further along the spectrum, we find the case of U.S. v. Bottone. (17) Bottone devised a scheme to appropriate and sell a drug process owned by Lederle Laboratories. He hired two employees to photocopy the document which recorded the process. The copies were then transported across state lines. The issue was whether photocopies are "goods" which can be converted. (18)

Allusions to physical elements are sprinkled throughout the reported case. Friendly, J. stated (19):

We are not persuaded that a different result should obtain simply because the intangible information that was the purpose of the theft was transformed and embodied in a different physical object. To be sure, where no tangible objects were ever taken or transported, a court would be hard pressed to conclude that "goods" had been stolen and transported within the meaning of s. 2314; the statute would presumably not extend to the case where a carefully guarded secret formula was memorized and carried away in the recesses of a thievish mind and placed in writing only after a boundary had been crossed. The situation, however, is quite different where tangible goods are stolen and transported and the only obstacle to condemnation is a clever intermediate transcription or use of a photocopy machine. In such a case, when the physical form of the stolen goods is secondary in every respect to the matter

recorded in them, the transformation of the information in the stolen papers into a tangible object never possessed by the original owner should be deemed immaterial.

In Bottomo, the physical elements which the court relied upon were: the culture used to prepare the drug according to the secret process, and the photocopies of the stolen information. The Court strained to find a result which accords with common sense and basic distinctions between right and wrong. The Court avoided a general pronouncement that misappropriation of information constitutes theft.

In Stewart, the High Court summarized the significance of Bottomo and its predecessors as indicating the difficulty which arises where a physical document is transformed into another tangible object. Although Krever, J. could visualize a link between the original record and the photocopy, the learned judge refused to "stretch the language of the Code" to find liability.

The majority of the Court of Appeal drew the formal veil and dealt with the true nature of "property". Houlden, J. stated in Stewart that the code protects information which is confidential, and which has been gathered through the expenditure of time and labour. The civil law definition of property was adopted as applicable to the Criminal Code. (20)

A second line of cases cited in Stewart in both trial and

appellate divisions, respectively, is based on 18 U.S.C. 641 which prohibits theft of "any record, voucher, money or thing of value of the United States."

In U.S. v. Lambert, (21) the issue was whether information (concerning the identity of potential informants and the status of drug investigations) constituted proper subject matter for a conviction of theft. A conviction was entered. In Stewart, the High Court distinguished the breadth of this section from the scope of S. 283(1) of the Criminal Code and held that the latter refers only to property which is tangible in nature. In the Court of Appeal, Cory, J.A. concluded that information is property, but offered the following qualification: (22)

(E)ven if it should be assumed for purposes of argument that information per se is not property, that is not determinative of the issue. There still remains a right of property in confidential information which, in my view, falls within the wide definition of property contained in s. 283(1). For example, the author or the author's employer has a property interest in certain compiled information which has long been protected at common law and is now, by the provisions of the Copyright Act, R.S.C. 1970, c. C-30.

3. The Conduct

Interception and alteration of data are examples of acts which violate the integrity of communication, regardless of whether loss has been suffered. Imposition of criminal sanctions for the interception of private communications and the offence of impersonation are particularly relevant to the

problem of software piracy.

3.1 Telecommunication

Transmission of software through a communications network increases the likelihood of interception. The RCMP has identified a number of forms of electronic eavesdropping which are commonly employed to infiltrate a system. These include wiretapping and bugging, analysis of electromagnetic radiation from equipment, and analysis of cross-talk induced in adjacent electrical circuits. Communications can also be rerouted.

The provision with respect to telecommunication is one example of "single instance legislation". S. 287(1)(b) reads as follows:

287. (1) Every one commits theft who
fraudulently, maliciously, or without
colour of right.....
(b) uses any telecommunication facility
or obtains any telecommunication service.

This section fastens upon theft of a particular object, which is not otherwise encompassed within the general heading of theft, S. 283. Other such instances are to be found in sections 299, 314, 293, 583, 299; respectively.

As authority for the proposition that penal statutes should be construed strictly, the High Court in Stewart referred to statements by Chief Justice Laskin and Estey, J. in R. v. McLaughlin (23) that a computer is not a

"telecommunication facility" within S. 287(2) of the Criminal Code. A computer is merely a data processing facility. The court stated that the purpose of the computer is not to channel information to outside recipients, but to perform complex calculations and to process and store information.

McLaughlin should be confined to its facts. This case would not be applicable to a situation where the computer is used as an instrument of information transfer.

3.2 Fraud

The third and final ground of liability argued by the Crown in Stewart pertained to fraud. S. 338 reads as follows:

338. (1) Every one who, by deceit, falsehood or other fraudulent means, whether or not it is a false pretense within the meaning of this Act, defrauds the public or any person, whether ascertained or not, of any property, money or valuable security...

is guilty of an offence. In R.v. Olan, Hudson and Hartnett (24) two elements were identified as inherent in this offence: dishonesty and deprivation.

Mr. Justice Krever expressed no doubt that the conduct described in Stewart reflected dishonesty. The issue at trial was whether there was deprivation in the nature of "any property, money or valuable security." On the facts, there was

easily no valuable security, and the learned justice held that property must be tangible. There was no open market upon which to correlate deprivation to the commercial value of the information since it was not intended for sale. By analogy, misappropriation of a trade secret which is not intended for publication on an open market should not constitute fraud.

It would appear that the offence of fraud does allow scope to prosecute piracy if the program is designed for sale. The software can easily be misappropriated when a user signs on to a computer and downloads the program by means of someone else's password. Economic deprivation ensues. It is precisely the issue of commercial loss which has prompted the outcry voiced by software houses.

The Ontario Court of Appeal considered the scope of this section with reference to unauthorized reproduction and sale of copyrighted videotapes, in the case of R. v. Kirkwood. (25) The accused was the owner of an electronics company. He made a conscious decision to sell and rent videotapes which he knew to be counterfeit. The trial judge found as a fact that the accused was depriving the owners of copyright of the distribution revenues which they would otherwise be earning. Nevertheless, he was acquitted. The appeal was allowed, and a new trial ordered.

On appeal, Lacourcière, J.A. relied upon R. v. Olan to hold that deceit is not an essential element to the offence of

fraud, and there need be no personal nexus between the fraudsman and his victim. (26) The mens rea was inferred from the willingness of the accused to distribute the counterfeit video cassettes knowing that they were counterfeit. The court held (27)

(T)he facts proven and admitted are capable of supporting the proof of the commission of a fraud by "other fraudulent means" within the meaning of s. 338.

It would appear from this case that a buyer who is apprised of the illegitimacy of the tape is an accomplice. An oblivious buyer who later discovers that the tape is not authentic is as much a victim of the fraud as is the copyright owner. It is arguable that the counterfeit copy is poorer in quality than the original.

The Law Reform Commission proposes the following definition:

S:1 A person commits fraud who dishonestly by
 (a)deceit, or
 (b)unfair non-disclosure, or
 (c)unfair exploitation
 either induces any person including the public to part with any property or causes him to suffer financial loss. (28)

The definition is adequate to encompass computer piracy, which amounts to unfair exploitation which causes the developer to suffer financial loss.

3.3 Impersonation

S.361 of the Code provides a possible source of liability.

It reads as follows:

361. Every one who fraudulently personates any person, living or dead,
(a) with intent to gain advantage for himself or another person,
(b) with intent to obtain any property or an interest in any property, or
(c) with intent to cause disadvantage to the person whom he personates or another person,
is guilty of an indictable offence, and is liable to imprisonment for fourteen years.

A person who signs on to a computer by way of a false password obtains access to the program by dishonest means, viz., impersonating the rightful owner of the code. This is so whether the program takes the form of printout, tape, or cassette.

The advantage to proceeding under this section is that it focuses upon the quality of conduct, rather than the nature of the property.

4. Conclusion

The criminal law is designed to deter conduct which is particularly odious. Children who trade video games and university students making use of educational resources

provided by major software houses could remain outside the grasp of this branch of the law. The Law Reform Commission of Canada has determined that imposition of criminal sanction should be a last resort.

S. 1.3 of the Draft Statute on Theft and Fraud (29) is directed to criminalizing unauthorized use of telecommunication, telephone communication, and computer services.

The issue of "deprivation" is addressed in s.2. The section creates the offence of Dishonest Taking. It states:

A person commits dishonest taking who dishonestly and without consent takes another's property though without intent to permanently deprive.

The Commission recognizes that it would not be appropriate to criminalize the broad heading of misappropriation of "information" because it would unduly expand the scope of the criminal law. Moreover, if information were considered as "property" it would also be subject to other legislation, such as taxation. This would impose a burden upon the industry. The innocent user would be penalized since prices would rise. Access to software would be restrained indefinitely.

Another possible solution would be to amend the Criminal Code by adopting a provision which speaks directly to the issue

of software piracy. The Canadian Copyright Act provides a summary offence and fine not exceeding two hundred dollars

s. 25 Where any person knowingly
 (a) makes for sale or hire any
 infringing copy of a work in
 which copyright subsists,
 (b) sells or lets for hire,
 or by way of trade exposes or
 offers for sale or hire any
 infringing copy of any such work,
 (c) distributes infringing copies of
 any such work either for the
 purpose of trade or to such an
 extent as to affect prejudicially the
 owner of the copyright,
 (d) by way of trade exhibits in
 public any infringing copy of any
 such work, or
 (e) imports for sale or hire into
 Canada any infringing copy of any such work...

Prosecutions under this quasi-criminal section of the Copyright Act are few and far between. The penalty provided is too lenient to impose substantial deterrence. Nevertheless, it is a good model for legislation with respect to software piracy. Modification of the terminology is necessary because computer programs do not easily fit within the framework of the Canadian Copyright Act. The words, "a work in which copyright subsists" would be replaced by "a computer program". This solution has the advantage of satisfying the two aims of those who wish to thwart piracy. It focuses upon the nature of conduct as wilful, addressing the issue of mens rea. Secondly, it speaks to its purport, unauthorized acquisition of an object of commerce.

FOOTNOTES

1. Stephen, History of Criminal Law, cited in R. Moskoff, "Fraud : Either Change or Perish" (1981) 24 Crim. L. Q. 117.

2. "Theft and Fraud", Working Paper 19, Law Reform Commission (Ottawa, 1977) at p. 38.

3. Ibid., at p. 43.

4. 32-33 Vict. Ch. 21, consolidated with other criminal statutes in 1887 R.S.C. ch. 164.

5. Supra, note 2 at p. 48.

6. Stephen, op. cit. note 1 at p. 127, cited supra, note 2 at p. 43.

7. 1 Hale P.C. 509 : it is not larceny to borrow without authorization, contra S. 283 of the Canadian Criminal Code.

8. (1983) 42 O.R. (2d) 325 (O.C.A.) overturning (1982) 38 O.R. (2d) 84 (O.H.C.).

9. S. 387.

10. S. 283.

11. S. 338.

12. supra, note 8 at p. 235.

13. (1984) 13 C.C.C. (3d) 430 (O.H.C.).

14. G. Fletcher, "The Metamorphosis of Larceny" (1976) 89 Harv. Law Rev. 469.

15. supra, note 8 at p. 239.

16. 402 S.W. 2d 906 (Texas Court of Criminal Appeals 1967).

17. 365 F. 2d 389 (2d Cir. 1966).

18. 18 U.S.C.A. 2314.

19. supra, note 17 at p. 393.

20. supra, note 8 at p. 237.

21. 446 F. Supp. 890 (D. Conn. 1978).

22. supra, note 8 at p. 242.

23. [1980] 2 S.C.R. 331.

24. [1978] 2 S.C.R. 1175.

25. R. v. Kirkwood (1983) 42 D.R. (2d) 65 (D.C.A.).

26. Ibid., at p. 71.

27. Ibid., at p. 72. Lacourcière, J.A. stated that he was unaware of a decision in which S. 2 of the Criminal Code was held to include copyright. He stated that physical objects, such as cassettes could be stolen.

28. supra, note 2.

29. Ibid.

CONCLUSION

The basic difficulty in identifying an appropriate legal means of protecting computer software arises from the diverging descriptions of the technology. The discussion has centred on the nature of the program : whether it is tangible or intangible, corporeal or incorporeal, idea or expression.

1. Tangible or Intangible

The analogy most commonly drawn is between the musical score and the computer program. (1) The melody is analogous to the algorithm, and in both cases the process of development involves "shaping the invisible". The paper and ink are the tangible elements which are analogous to the markings in the machine. The latter may take the form of rotating shafts, holes in cards, magnetic flux, vacuum tubes, transistors and integrated circuits embedded on silicon chips.

The program has been defined as an "intangible message embedded in a material medium." (2) To fit within the Criminal Code provision of "theft", the courts could affirm that computer software is tangible, or that it attracts a proprietary right. The Department of Justice has introduced a Bill to sanction theft and mischief in relation to data and property. (3)

In R. v. Stewart (4) the Crown asked the Ontario Court of Appeal to accept the notion of "invisible theft". The court recognized that intangible property which is property for the purposes of the civil law is also property within the meaning of the Criminal Code provisions on theft. Cory, J.A. referred to the hotel's copyright in the unpublished list of employees. Houlden, J.A. reviewed the jurisprudence protecting confidential information.

A court could apply the relevant sections of the Criminal Code which currently sanction the misappropriation of tangible property. However, prosecution of theft of the material support ignores the pith and substance of the deed. This was implicitly recognized when Gray, J. accepted the charge of mischief as appropriate in connection with the electronic alteration of data in Re Turner and The Queen (5).

Separating medium from message leads to the characterization of the programmer's task as one of devising a method to solve a problem. Solutions to problems are traditionally protected by the common law as trade secrets. The Department of Justice is participating in a joint project with the Alberta Law Reform Institute with a view to drafting a Uniform Trade Secrets Act. This effort has been prompted by the concern for the protection of computer software as confidential information.

In order to protect the program as a trade secret, the developer must ensure that he does not permit release of the program into the public domain. This form of protection is counter-productive since it is antithetical to the dissemination of information. It is, moreover, inefficient since the obligation of confidentiality is binding only upon the covenantee.

2. Idea or Expression

Computer software is unlike forms of expression known to the law.

There is a qualitative difference between the computer as a medium of expression and clay or paper. Like the genetic apparatus of a living cell, the computer can read, write and follow its own markings to levels of self-interpretation whose intellectual limits are still not understood. Hence the task for someone who wants to understand software is not simply to see the pot instead of the clay. (6)

Should the program be characterized as an original work of authorship, the copyright legislation would afford protection to the program. The idea and expression have not fused. Each developer adopts a unique style of design.

Copyright is the preferred form of legal protection of computer software. The copyright legislation in Australia, Hungary, the Philippines and the United States has been amended specifically in this regard. (7) In addition, several reported decisions have afforded protection to computer programs under existing legislation in France, Germany, Italy, Japan and the United Kingdom. (8)

In order to establish protection pursuant to the Canadian Copyright Act, the program must first be characterized as one of the protected forms of expression. S. 3(1)(d) of the Canadian Copyright Act affords the owner of copyright in a protected form, e.g. the literary work, the right to make any contrivance by means of which the work may be mechanically performed or delivered. The computer program must be worthy of protection apart from the machine which aids in its performance or delivery.

Protection of the program as a literary work does not achieve certainty. For example, it is unclear whether a program in machine readable form is a writing. Protection of the chip as a mechanical contrivance can be challenged on the basis that the program is electrical rather than mechanical.

The U.S. Copyright Act specifically extends copyright to works which are perceptible "with the aid of a machine or device." (9) The "computer program" is defined as a

set of statements or instructions to be used directly or indirectly in a computer in order to bring about a certain result. (10)

3. Sui Generis Statutory Protection

The length of protection currently extended by the Copyright Act relates to the life of the author. This is the term of protection extended by members of the Berne Copyright Convention to literary works. It is inappropriate in relation to software for two reasons. This is primarily because more than one individual participates in the development of the program. The corporation as employer will usually command copyright ownership. Secondly, the term is longer than the commercial lifespan of a computer program.

The developer's right to compensation should not be too lengthy, nor should the end user be forced to pay too high a price as a result of the developer's exclusionary right.

The White Paper introduced by the former Liberal Government, From Gutenberg to Telidon does recommend a modified form of sui generis protection for computer programs. The White Paper suggests that programs in source code be treated differently than programs in object code. While source code is characterized as a literary work, object code is given the shorter term of protection of five years, with an additional five year term available to updates.

Sui generis protection for programs in object code presents some difficulties. The choice of publication is without technological basis. To introduce these proposals would be to cut back on the protection accorded by our courts to object code as a translation of the source literary work. Lapse of protection for object code would effectively terminate protection of the source program. Foreign developers could well refuse to license their works in Canada. Uniform treatment must be given to programs in object and source code.

4. A Framework for Protection of Computer Software in Canada

We have seen two competing policy considerations throughout this discussion. First, the law seeks to associate research and development with material reward. This is the "incentive" principle. Secondly, information is not subject to monopolization. This is the "common heritage of mankind" principle.

The first principle regards the work of developers as worthy of protection. In the interest of fairness, benefits should accrue to the party who has invested the effort in developing and promoting a commercial product.

Certain aspects of copyright protection must be expanded to conform to this principle. Rental rights must be introduced in view of current market practices. The jurisdiction of the

Copyright Appeal Board should be broadened to license the software and to collect royalties on behalf of the copyright owners.

Related to the issue of protection is that of infringement. Detection of infringement is made difficult by lack of familiarity with alpha numeric expression. A board of experts could be set up to make fact finding determinations as to whether infringement has occurred.

The law must keep pace with the rapid changes in the technology, and particularly in the ways in which programs are written. For example, during the past forty years the process of writing a program has been that of writing recipes, whereas more recently the end user has become able to use a spreadsheet to communicate directly with the applications program to resolve the problem. It is anticipated that the computer will eventually develop the program. The computer has the capacity to simulate a new program, and indeed an entirely new computer. Legislation must clarify whether computer generated works are protected by copyright. The requirement of fixation should be satisfied if the program is reduced to any material form from which the work can be reproduced.

The second principle is a refinement of the first. It qualifies the material reward which is conferred upon the software developer. The need for qualification arises because of the overriding principle that the consumer must not be

denied access to information. This could result if the software developer were to base the claim to protection upon an exclusionary right to restrict the exploitation of information.

FOOTNOTES

1. D. M. Davidson, "Protecting Computer Software", (1983) 23 Jurimetrics Journal 339.

2. A. Kay, "Computer Software", (1984) Scientific American Vol. 251, No. 3 p. 53. See also H. Fox, The Canadian Law of Copyright and Industrial Designs, (2d) (Toronto : Carswell, 1967) at p. 286.

3. Criminal Law Amendment Act, 1983.

4. (1983) 42 O.R. (2d) 225 (O.C.A.).

5. (1984) 13 C.C.C. (3d) 430 (O.H.C.).

6. Supra, note 2 at p. 56.

7. UNESCO/WIPO/GE/CCS, Group of Experts on the copyright aspects of the protection of computer software. Geneva : February 25 to March 1, 1985.

8. Ibid.

9. 17 U.S.C. 102(a).

10. 17 U.S.C. 101.