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Influence of Copyright on the Emergence of New Technologies: a North American Perspective

A thesis submitted to the Faculty of Graduate Studies and Research in partial fulfillment of the requirements of the degree of master.

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November 1999

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Abstracts

Ce mémoire de maîtrise étudie l'impact du droit d'auteur Nord Américain sur l'évolution technologique. Sa première partie propose une vision large du droit d'auteur englobant la réalité canadienne et américaine. Suite à l'étude des différentes définitions légales de ce concept, de son origine et de ses justifications sous-jacentes, se construit une définition englobante du droit d'auteur en Amérique du Nord. La deuxième partie s'attarde aux différentes confrontations historiques entre le copyright et l'apparition de nouvelles technologies. Elle étudie et analyse l'évolution de la presse à imprimer, de la photographie, du piano mécanique, du cinéma, de la radio, de la télévision par câble, du photocopieur, du vidéo, de la cassette audio digitale et du lecteur MP3, ainsi que la réaction des acteurs juridiques à ces dernières. L'ensemble de ces éléments permet de déterminer l'influence du copyright sur le développement technologique.

This thesis studies the impact of North American copyright on technological development. The first section proposes a broad vision of copyright including both Canadian and American legal concepts. It analyses different modern definitions of copyright, the origin of the concept and its underlying justifications. The second section presents the historical relations between copyright and technologies. It studies the history of the printing press, the photography, the player-piano, the motion picture, the radio, the cable TV, the photocopier, the videotape, the Digital Audio Tape and the MP3, and the legal challenge they represented. Those elements give us the opportunity to evaluate the influence of copyright on technological development.

Acknowledgments

À Sunny Handa, pour sa patience, sa générosité et sa passion du droit ...

À Ysolde Gendreau, pour ses précieux conseils...

À Me André P. Casgrain, pour avoir cru en moi dès mes débuts...

À mes parents Marielle Marquis et Raymond Deschamps, pour leur présence et leur support...

À mon conjoint, Marc Tanguay, pour sa bonne humeur quotidienne...

I. INTRODUCTION

> *We must take care to guard against two extremes equally prejudicial; the one, that men of ability, who have employed their time for the service of the community, may not be deprived of their just merits, and the reward of their ingenuity and labour; the other, that the world may not be deprived of improvement, nor the progress of the arts be retarded.*
> Lord Mansfield

In the 20th century, technological developments have changed the way we live. Our grandparents' letters took days or even weeks to arrive at their destination; now we can communicate by e-mail, and our messages arrive almost instantly. Twenty years ago, one had to learn computer languages to use a personal computer; now we can easily surf the "Net" using sophisticated software.

Copyright protection has had to adapt to this new reality. Because such protection was conceived during the 17th and 18th centuries, it has not always been capable of addressing modern technological development. Through the ages, different approaches have been embraced to compensate for this deficiency. Sometimes technologies have been modified to comply with intellectual property rules, while at other times Copyright Acts have been extended to take into account technological progress. But has copyright delayed the evolution of technology? Has it deprived the world of improvement as Lord Mansfield feared it would? As the new millennium nears, it is interesting to address these questions.

Before beginning this study, it is important to determine what will be considered as "delayed technological development". Judging how ideas present themselves to an inventor, or whether inventors would have acted differently in the absence of copyright law, is unrealistic. It is also difficult to evaluate whether inventors might have discarded ideas if such ideas had infringed someone else's

copyright. Consequently, the objective of this study is not to determine whether some inventions died with their authors, but whether copyright hindered existing-creation development.

Although an inventor might conceive of a machine in one form, copyright may limit the use of some of its features, and the product might appear on the market in another form, one offering less possibilities than originally intended. Limiting features of a device can reduce its popularity; if the device is less popular, manufacturers will be unwilling to invest in producing and marketing it. While some persons particularly skilled in the field may have access to the machine, the population as a whole may be deprived of it. This thesis evaluates access to new technology from the point of view of the mass population and considers lower popularity to be included within the definition of "delayed technological development".

Consequently, for the purpose of this thesis, the expression "delayed technological development" means to affect negatively the distribution of scientific or mechanical inventions, including the diminution of a device's popularity.

To analyze copyright's influence properly, it is also necessary to determine what copyright actually is. Limiting the analysis to those copyright notions included in statutes would mislead our study. In some situations, the essence of copyright might have affected technological development even without the application of written law. In this second part, a study of the copyright's origin, definitions and justifications will lead to a valid definition of this privilege.

The third part is comprised of an historical study of the relationship between copyright and technologies. It examines how North American legislatures and courts have reacted to technological progress and dealt with the emergence of sophisticated systems of reproduction. Promoters of new techniques played an

important part in this process, and thus their reactions to legal obligations are also discussed.

All those elements will help determine the impact of copyright on technological development. In sum, this thesis attempts to answer a simple question: Has copyright law delayed or stifled technological development?[1]

[1] This question has already been asked for patent but never for copyright. See R.H. Saunders, "Does Canadian Patent Practice Impair Technological Development?" (1999) 15 C.I.P.R. 265.

2. THE ESSENCE OF COPYRIGHT

To study the impact of copyright on technological development, one needs to have a complete picture of the copyright concept. Limiting the copyright definition to statutory restrictions would mislead this study: technological development might have been influenced by the copyright restrictions included in written laws, but it might also have been affected by the fear of an extension of the statutes. New technology promoters might have altered it to avoid the attention of copyright supporters. A valid analysis of the impact of copyright needs to adopt a broad perspective and go beyond the statutes to understand the essence of copyright. This part tries to present an all-encompassing definition of the North American notion of copyright.

Another challenge of this part is to present a unique North American definition of copyright. Even though they have the same origin and name, American and Canadian copyright laws are different. The definition given in this part must be large enough to include both legal regimes.

Because current definitions are a good way to begin the study of any legal concept, this part first looks at the modern interpretation of copyright. Thereafter, it studies the origin of the concept and presents an analysis of its underlying justifications. Those different elements should lead to a clear picture of the copyright reality in North America.

2.1. Definitions

This study begins by looking at the different modern descriptions of copyright. American and Canadian statutes have their own versions of this notion. Courts, dictionaries, and authors also have their own points of view. This section compares the common elements of the different definitions.

Copyright Acts portray the legislatures' understanding of copyright. Nevertheless, neither the American nor the Canadian statutes provide a clear explanation of the notion. The general definition given in the *Canadian Copyright Act*[2] only refers to the different sections of the statute:

> "copyright " means the rights described in
> (a) section 3, in the case of work,
> (b) sections 15 and 26, in the case of a performer's performance,
> (c) section 18, in the case of sound recording, or
> (d) section 21, in the case of a communication signal.[3]

This approach makes it difficult to understand the Canadian statute's general position. By contrast, while the American legislation does not have an official definition of copyright, Section 106 proposes a general view of the concept:

> The owner of copyright under this title has the exclusive rights to do and to authorize any of the following:
> (1) to reproduce the copyrighted work in copies or phonorecords;
> (2) to prepare derivative works based upon the copyrighted work;
> (3) to distribute copies or phonorecords of the copyrighted work to the public by sale or other transfer of ownership, or by rental, lease, or lending;
> (4) in the case of literary, musical, dramatic, and choreographic works, pantomimes, and motion pictures and other
> audiovisual works, to perform the copyrighted work publicly;
> (5) in the case of literary, musical, dramatic, and choreographic works, pantomimes, and pictorial, graphic, or sculptural works, including the individual images of a motion picture or other audiovisual work, to display the copyrighted work publicly; and
> (6) in the case of sound recordings, to perform the copyrighted work publicly by means of a digital audio transmission.[4]

The statutes give a concrete and practical definition of copyright. A more theoretical view is proposed by the definitions elaborated by scholars and jurisprudence.

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[2] See *Copyright Act*, R.S.C. 1985, c. C-42, s. 2 [hereinafter *Canadian Copyright Act*].
[3] *Ibid.*, s. 2.

North American courts have tried to explain the copyright concept. The two following examples nuance the statutory definition:

> The right to multiply copies of a published work, or the right to make the work public and still retain the beneficial interest therein.[5]

> The exclusive right of multiplying copies of an original work or composition, and consequently preventing others from so doing.[6]

Dictionaries are another important source of legal definitions. *Black's Law Dictionary* defines copyright as:

> The right of literary property as recognized and sanctioned by positive law. An intangible, incorporeal right granted by statute to the author or originator of certain literary or artistic productions, whereby he is invested, for a specified period, with the sole and exclusive privilege of multiplying copies of the same and publishing and selling them.[7]

The Oxford English Dictionary is more concise:

> The exclusive right given by law for a certain term of years to an author, composer, designer, etc. (or his assignee) to print, publish, and sell copies of his original work.[8]

Its paperback version is also succinct:

> The sole legal right to print, publish, perform, film, or record a literary or artistic or musical work.[9]

Scholars have provided a more elaborate definition. *Copinger and Skone James on Copyright* states:

> Copyright ... is a property right which subsists in a number of different kinds of works, sound recording, films, broadcasts or

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[4] *Copyright*, 17 U.S.C. §106 (1998) [hereinafter *American Copyright Act*].
[5] *Underwriters' Survey Bureau* v. *Massie & Renwick*, [1937] Ex. C.R. 15 at 20.
[6] *Chappell* v. *Purday*, (1845) 14 M&W 303 at 316.
[7] H.C. Black, ed., *Black's Law Dictionary*, 6th ed. (St-Paul, Minnesota : West Publishing, 1990), *s.v.* "copyright".
[8] *The Oxford English Dictionary*, 2nd ed., *s.v.* "copyright".
[9] *The Oxford Paperback Dictionary*, 3d ed., *s.v.* "copyright".

> cable programmes, performances and the typographical arrangement of published editions.[10]

The reference to the property concept is also included in Kaplan's definition: "The protection of property in the products of mind... ".[11]

Fox simply states: "Copyright is the right to prevent copying or the issuing of copies to the public."[12] But Ploman and Hamilton speak about "[t]he individual right of an author to dispose of his work in return for remuneration."[13]

Even if they all seem to be different, these definitions share common elements. The owner of copyright is referred to as an author or a creator, and the object of the right, the work, has to be a creation, an intellectual product. Most definitions refer to an exclusive right that restrains others from copying or distributing the work. It is noteworthy that some scholars illustrate the right of the author in his creation by referring to the usual and well known property concept.[14] At the end of this part, these elements will facilitate the understanding of the North American reality of copyright. But before this we must complete this portrait by studying copyright's origin and justifications.

2.2. Origin

The first part of this section explains the evolution of copyright from its early beginnings to its crystallization in its modern form. It also briefly examines its evolution in North America.

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[10] K. Garnett, J.R. James & G. Davies, *Copinger and Skone James on Copyright*, 14th ed. (London: Sweet & Maxwell, 1999) at 25.
[11] B. Kaplan, *An Unhurried View of Copyright* (New York: Columbia University Press, 1967) at vii.
[12] H.G. Fox, *The Canadian Law of Copyright and Industrial Designs* (Toronto: Carswell Co., 1967) at I.
[13] E.W. Ploman & L.C. Hamilton, *Copyright: Intellectual Property in the Information Age* (London: Routledge & Kegan Paul, 1980) at 30.
[14] For more information about the relation between copyright and the property concept, see P.-E. Moyse, "La nature du droit d'auteur: droit de propriété ou monopole?" (1998) 43 R.D. McGill 507.

Authors often begin their analyses of copyright history by referring to the introduction of printing in England,[15] forgetting that manuscripts were bought and copied even before the printing press was invented.[16] The seed for the idea of copyright took root in the book industry.

While the Romans and Greeks were concerned by the right of the author to be recognized as the creator of his work, it appears that they were uninterested in the control of copies of the work.[17] In modern terms, we can say that they were more interested in moral than economic rights. For example, they created the term *plagiarius*, Latin ancestor of the word plagiarism,[18] which means an abductor or a kidnapper. Even at that time, pretending to be the author of somebody else's work was considered as immoral and fraudulent.[19] However, no specific rights seem to have existed for intellectual works.[20] The writings of the most famous legal scholar of that time, Justinian, do not mention any legal concept concerning the right of the author to control copies of his work.[21]

Statutes dealing with copyright did not exist until the invention of the printing press. This fact can be explained by the little practical need for this kind of exclusive right. In the Middle Ages, the majority of the population was illiterate and had no use for books. Also, the copying of manuscripts was a laborious and

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[15] See J. Lahore, *CopyrightLlaw: Intellectual Property in Australia*, looseleaf (Sydney: Butterworths, 1996) at 1852; L.R. Patterson, *Copyright in Historical Perspective* (Nashville: Vanderbilt University Press, 1968) at 20; Kaplan, *supra* note 11 at 2. See also A. Birrell, *Seven Lectures on the Law and History of Copyright in Books* (South Hackensack, NJ: Rothman Reprints, 1971) at 41.

[16] See Birrell, ibid. at 47.

[17] See P. Goldstein, *Copyright's Highway: from Gutenberg to the Celestial Jukebox* (New York: Hill and Wang, 1994) at 39. On the conception of authorship in antiquity, see C. Aide, "A More Comprehensive Soul: Romantic Conception of Authorship and the Copyright Doctrine of Moral Right" (1990) 48 U.T. Fac. L. Rev. 197 at 213.

[18] "to take and use (another person ideas or writings or inventions) as one's own.". *The Oxford Paperback Dictionary*, *supra* note 9, *s.v.* "plagiarize".

[19] See Birrell, *supra* note 15 at 9.

[20] Moral rights were protected by the general obligation of proper behavior. See H.L. Pinner, *The World of Books in Classical Antiquity* (Leiden: A.W. Stijthoff, 1958) at 25; Garnett, James & Davies, *supra* note 10 at 31.

[21] See Garnett, James & Davies, *ibid.* at 31; Birrell, *supra* note 15 at 9.

time-consuming task.[22] The production of books was limited to the copying by monks of religious works for religious orders and the royalty of Europe.[23] Such copies were written by hand, and it took almost as long to copy the work as to create it.

The earliest record of a copyright case dates back to sixth-century Ireland, where St-Columba, while on a visit to the monastery of his teacher Abbot Finnian, copied the Abbot's psalter. Finnain demanded that the copy be returned, and when he did not get satisfaction, he referred the dispute to the King. The monarch ruled in his favor, stating " to every cow her calf and consequently to every book its copy ".[24] Another example of the assumption of the right of the author in the copies of his work was the fees charged by monasteries to obtain permission to reproduce a book.[25]

German printer Johannes Gensfleisch, alias Gutenberg, invented the printing press in 1434.[26] In 1450, he also conceived the typography technique that facilitated the printing of numerous books. Those technologies, introduced in England by Caxton,[27] have encouraged the reproduction of works and have increased the value of the creativity of an author as opposed to the material copies of his work.[28] Printing had an important impact on the legal treatment of the book industry. In fact, if it was lawful to make three copies of a work by hand, it was equally lawful to print four hundred copies of the same work.

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[22] See G.H. Putnam, *Books and their Makers during the Middle Ages: A Study of the Conditions of the Production and Distribution of Literature from the Fall of the Roman Empire to the Close of the Seventeenth Century*, vol. 1 (New York: G.P. Putnam's Sons, 1896-1897) at 16ff.
[23] See *ibid.*; Birrell, *supra* note 15 at 48.
[24] Putnam, *ibid* at 46; Garnett, James & Davies, *supra* note 10 at 32; Birrell, *ibid.* at 42.
[25] See M. Rose, *Authors and Owners: The Invention of Copyright* (Cambridge, Mass.: Harvard University Press, 1993) at 9.
[26] See Part 3.1., below, for more on this topic.
[27] In 1474. See Lahore, *supra* note 15 at 1852; Putnam, *supra* note 22 at 110. However, some fix this introduction in 1476 (see Kaplan, *supra* note 11 at 2), others in 1491 (see Birrell, *supra* note 15 at 41).
[28] See Goldstein, *supra* note 17 at 39.

In 1483, a statute introduced during the reign of Richard III[29] responded favorably to the printing technology by encouraging the printing of books and their importation. At that time, only four presses existed in England and the King wanted to increase the availability of printed books.[30]

A more protectionist approach was adopted during the reign of Henry VIII. In 1533, the King sanctioned a statute repealing that of Richard III. This gesture was officially justified by the numerous printed works imported and by the capacity of the King's subjects to handle a printing press :

> [The King's natural subjects] have given themselves so diligently to learn and exercise the said craft of printing, that at this day there be within this realm a great number cunning and expert in the said science or craft of printing as able to exercise the said craft in all points as any stranger in any other realm or country.[31]

It is important to note that this change of position was made the same year as the King's "great matter". He declared himself "head of the Church", had his marriage with Catherine of Aragon annulled and married Anne Boleyn.[32] As Protestantism was by then the only religion permitted in England, it seems that the true purpose of this law was to prevent the importation of Catholic books.[33] It was also a way to increase distribution of books written to promote the new national religion.

This presumption is enforced by the concepts of printing patents and printers' licenses, introduced in 1538.[34] In the printing patent system, which was parallel to the stationer's copyright, the Sovereign granted a printing patent giving an

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[29] See *Importation of Books by Aliens Act*, 1 Ric. 3, c.9. See also Garnett, James & Davies, *supra* note 10 at 32.
[30] See Patterson, *supra* note 15 at 22.
[31] *Printers and Binders Act*, 25 Hen. 8, c. 15.
[32] See D. Loades, *Henry VIII and his Queens* (Godalming, England: Bramley Books, 1997) at 59-64.
[33] This censorship purpose is also recognized in Kaplan, *supra* note 11 at 3.
[34] See Patterson, *supra* note 15 at 23. See also Birrell, *supra* note 15 at 56.

exclusive right to publish a work[35] or a class of works.[36] In case of conflicts, this right prevailed over the stationer's copyright.

On the other hand, a printer's license was a permission by the censorship authorities to print a book. Every book required a license. This permission was not conferring any privilege to print.[37] Printing patents and printers' licenses had the primary advantage of providing revenues to the Crown and permitting censorship "against heresies".[38]

In 1556, the Catholic daughter of Henry VIII, Queen Mary, granted the Charter of the Stationers' Company.[39] Because the new monarch wanted to restore Catholicism as the only religion in England, she used the book industry to prevent the propagation of Protestant ideas. The charter imposed severe restrictions on the publishing trade and the press. In the same year, a decree of the Star Chamber imposed a restriction on printing contrary to "any injunctions, letter patents, ordinances, prohibitions or commandments set forth by the authorities or included in any of the statutes".[40]

Elisabeth I succeeded Queen Mary in 1558.[41] The new queen was Protestant and tried to reinstate her religion in the Kingdom. To that end, she used the same tools as her sister.[42] She confirmed the Charter of the Stationers' Company and used the Star Chamber to regulate the manner of printing and the number of presses permitted. Those restrictions were enforced by the use of summary power of search, confiscation and imprisonment.

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[35] Some printing patents, named "particular", were limited to a specific work for a limited period of time, usually seven to ten years. See Patterson, *ibid.* at 79.
[36] This type of printing patent was called "general" and was granted for life on a class of work such as law books and almanacs. See *ibid.*
[37] See *ibid.* at 87.
[38] Garnett, James & Davies, *supra* note 10 at 33 ; Patterson, *ibid.* at 24.
[39] See Garnett, James & Davies, *ibid.* at 33; Lahore, *supra* note 15 at 1853. For some, it was in May 1557. See Kaplan, *supra* note 11 at 3.
[40] Garnett, James & Davies, *ibid.*
[41] See *Le petit Robert 2: dictionnaire universel des noms propres*, 2nd ed., *s.v.* "Elisabeth 1re".

The first Star Chamber Decree was adopted in 1566.[43] As authorities were concerned by censorship and stationers were interested in copyright ownership, both worked conjointly. In June 1586,[44] a new decree enforced the licensing of every book and prohibited the printing of:

> any book, work, or copy against the form or meaning of any restraint contained in any statutes or laws of this realm, or in any injunction made by Her Majesty, or Her Privy Council; or against the true intent and meaning of any letters patent, commissions, or prohibitions under the great seal, or contrary to any allowed ordinance set down for the good government of the Stationers' Company.[45]

This decree was to become the mainstay of censorship in England for the next fifty years. It consolidated the Stationer's Company as the controller of the publishing system.

In 1603, the Stuart dynasty followed Queen Elizabeth's reign. The Stuarts continued her printing and licensing of book politics. Because they were more interested in power than in the public interest, they strengthened the censorship system.[46] This approach is illustrated in the Star Chamber Decree of 1637, which codified those legal obligations.[47]

In 1640, Charles I abolished the Star Chamber. The next year, because of the Cromwellian revolution, the King also lost his authority and power, and all the previous legal rules enacted by both those authorities were considered illegal.[48]

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[42] See Garnett, James & Davies, *supra* note 10 at 33.
[43] See Patterson, *supra* note 15 at 39.
[44] See *ibid.* at 116 and Kaplan, *supra* note 11 at 3. Some fix the date of this second Star Chamber Decree in 1585, see Garnett, James & Davies, *supra* note 10 at 33.
[45] Garnett, James & Davies, *ibid.* at 33.
[46] See Patterson, *supra* note 15 at 119ff.
[47] See Garnett, James & Davies, *supra* note 10 at 33.
[48] See *ibid.* at 34.

In 1642, the House of Commons made a surprising order, recognizing a form of an author's rights:

> It is ordered that the Master and Wardens of the Company of Stationers shall be required to take especial Order that the printers do neither print nor reprint anything without the consent of the Author.[49]

Unfortunately, this order was not followed, and no action seems to have been taken on this basis.[50] This change in the copyright approach appears to have gone relatively unnoticed.

It was not until the restoration of the monarchy that any evolution in the copyright concept became apparent. In 1662, the first *Licensing Act* [51] was adopted. It was the first statute to acknowledge officially a right of property on "brain" products.[52] This statute required that every book be licensed and registered with the Stationers' Company before being printed.[53] The *Act* also empowered the King's messengers, and the master and wardens of the Stationers' Company, to seize books suspected of containing material hostile to the Church or Government.

This system lasted until May 1679. The *Licensing Act* was a statute empowered for a pre-determined period of time, and it was not renewed.[54] The exclusive and perpetual rights belonging to members of the Stationers' Company had led to high prices and to a decreased availability of books.[55] The disrepute of the *Licensing Act 1662* was also due to emerging "freedom of the press" ideas.

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[49] Birrell, *supra* note 15 at 65.
[50] See *ibid.* at 65.
[51] See *Licensing of the Press Act*, 13 & 14 Cha. 2, c. 33. See Garnett, James & Davies, *supra* note 3 at 34; Birrell, *ibid.* at 60.
[52] See Garnett, James & Davies, *ibid.* at 35.
[53] See Patterson, *supra* note 15 at 139; Rose, *supra* note 25 at 31.
[54] See Garnett, James & Davies, *supra* note 3 at 35; Birrell, *supra* note 15 at 60. Some fix the end of this regime in 1694. See Patterson, *ibid.* at 139.
[55] See Garnett, James & Davies, *ibid.* at 35.

In 1681, all the legislative protections having ceased, the Stationers' Company adopted an ordinance governing its members.[56] This decree stated that the ownership of a book was determined by its inscription in the Company's register.[57] The owner had an exclusive right to make copies of the work, and any members infringing on this exclusive privilege was required to pay a penalty. This system was based on the acknowledgment of a common law right of property for intellectual materials. Although the stationer's copyright was not new, the ordinance reinforced a system that had existed since 1556.[58]

In 1694, the ordinance of the Stationer's Company was refined. This version stipulated that, in case of death of a member, his proprietary right was bequeathed to his wife and children. It also stated that, if any members, without permission, sold or copied a book registered by another member, he would have to pay a fine of 12 pence for every copy.[59]

It is difficult to discern the underlying principles of the stationer's copyright because the rules were made to accommodate business transactions. The stationer's copyright was strictly a right to publish a work.[60] The copyright owner did not own the work in question as such and was not entitled to make any modifications to it. In fact, the author did not give up all his rights when he sold his manuscript to the stationer. It was still the author's exclusive right to alter his work.[61] It is interesting that a kind of moral right was recognized even in this primitive form of copyright.

At the beginning of the 18th century, booksellers lobbied Parliament to adopt a new Licensing Act that would allow an exclusive printing right. They pleaded that, without protection of authors' works, the public interest would be harmed

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[56] See *ibid.*; Birrell,, *supra* note 15 at 78ff.
[57] See Birrell, *ibid.* at 74.
[58] See *ibid.* at 71.
[59] See Garnett, James & Davies, *supra* note 3 at 36.
[60] See Patterson, *supra* note 15 at 9.

because the number of books produced would decrease. The philosopher John Locke, despite his opposition to a licensing system leading to a monopoly, also made representations, claiming a reward for the time and effort invested by authors in the writing of a book. Numerous petitions were presented to the House of Commons.[62]

The first British *Copyright Act* was adopted in 1709 and came into force on 10 April 1710.[63] It enacted a new legal system based on the recognition of the value of the author's work. The statute recognized the author as the subject of copyright.[64]

The *Statute of Anne* introduced the principle of a limited term of protection.[65] The *Statute* gave authors of already-printed books the exclusive right to print them for twenty years,[66] calculated from the date of entry into force of the *Statute*. Authors of books "not then printed" had the sole right to print them for fourteen years, from the date of publication. At the end of this term, the sole right to print or dispose of copies would return to the author for another fourteen years, if he was still alive.[67] Before publication, the title of the work had to be registered with the Stationers' Company, and then nine copies had to be distributed to different libraries. The *Statute* established a penalty of a penny for every sheet copied, with the fine to be divided between the Crown and the complainant.

The *Statute of Anne* was the first law adopted by the Parliament dealing with copyright. Its purpose was to increase the flow of works and to encourage

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[61] See *ibid.* at 71.
[62] See Garnett, James & Davies, *supra* note 3 at 36.
[63] See *Statute of Anne*, 8 Anne, c. 19. See F.C. Avis, *The First English Copyright Act* (London: Glenview Press, 1965) at 8; Garnett, James & Davies, *ibid.* at 37.
[64] See Birrell, *supra* note 15 at 93.
[65] See Garnett, James & Davies, *supra* note 3 at 37; Birrell, *ibid.* at 20; Rose, *supra* note 25 at 4.
[66] See Birrell, *ibid.* at 94.
[67] See *ibid.* at 95.

learning.[68] It was also the first Act concerning printing rights not to be directly connected with censorship. The Act expressly stated that it did not affect the importation or sale of books printed beyond the seas in foreign languages; thus foreign authors were excluded from copyright protection.[69]

It is important to understand the *Statute of Anne* because its provisions form the basis of the modern copyright law. Interestingly, the Act was based on the stationer's copyright. The same mechanisms were used to obtain the right in both systems. The only changes were the limited term of the right and the possibility for anyone to be entitled of it. The new concept in fact eliminated the monopoly of the publishers, who were the principal lobbyists of the legislation![70]

This approach changed the perception of copyright. Instead of being a publisher's right, it became an author's right because only the author had the right to a renewed term. Unfortunately, the few moral rights recognized by the stationer's copyright were not preserved in the *Statute of Anne*.[71]

The assumption that the ownership of the work belonged to the author was strengthened by the representations made by the stationers in the "Battle of the Booksellers".[72] In 1731, the exclusive rights of the Stationer's Company on materials printed before the *Statute of Anne* legally expired. Those rights being the basis of the industry, the printers tried to guard their monopoly. They went to court against the new copy makers and argued that, based on a natural right, the author, as a creator, had a perpetual common law copyright in his work. They pretended that this right had been assigned to themselves. A 1769 decision[73] agreed with them, stating that there was a common law right of an

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[68] See Garnett, James & Davies, *supra* note 3 at 37.
[69] See Birrell, *supra* note 15 at 27.
[70] See Patterson, *supra* note 15 at 13.
[71] See *ibid.* at 77.
[72] *Ibid.* at 15.
[73] See *Millar* v. *Taylor*, 4 Burr. 2301 (1769). See Garnett, James & Davies, *supra* note 3 at 38; Birrell, *supra* note 15 at 112ff; Lahore, *supra* note 15 at 1864ff; Rose, *supra* note 25 at 113ff.

author in the copies of his creation that the *Statute of Anne* had not taken away. However, in 1774, the House of Lords[74] overturned this decision, declaring that copyright was a statutory protection created by the 1709 Act.[75] The common right on published books had been extinguished by the *Statute of Anne* but it still existed for unpublished works. The once-protected books were now in the public domain.

Therefore, four kinds of copyright existed at the beginning of the 18th century: (1) the new statutory copyright created by the Act; (2) the stationer's copyright, which had been extended for twenty-one years; (3) the common law right regarding unpublished works; and (4) the printing patent right, which retained its status quo.[76] It seems that this last type of copyright was by then of little importance and Parliament has, to this day, chosen not to address it.

The *Statute of Anne* remained in force until 1842.[77] The copyright scope, however, was extended. Musical and dramatic compositions were incorporated into the legal definition of book as contained in the *Statute*.[78] Other statutes were enacted to protect engravings[79] and sculptures.[80] The duration of copyright was altered in 1814, and the two consecutive fourteen-year periods were replaced by the term of the author's life or twenty-eight years, starting from the date of publication.[81] In 1833, Parliament adopted the *Dramatic Copyright Act*,[82] which protected public performances of dramatic works.

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[74] See *Donalson* v. *Beckett*, (1774) 4 Burr. 2407; Garnett, James & Davies, *ibid.*; Birrell, *ibid.* at 124; Lahore, *ibid.* at 1866ff.
[75] Patterson, *supra* note 15 at 172ff; Garnett, James & Davies, *ibid.* See also Birrell, *ibid.* at 22.
[76] Patterson, *ibid.* at 148.
[77] See Birrell, *supra* note 15 at 20; Garnett, James & Davies, *supra* note 3 at 38.
[78] See *Bach* v. *Longman* (1777), 2 Cowp. 623.
[79] See *Engraving Copyright Act*, 8 Geo. 2, c. 13.
[80] See *Sculpture Copyright Act*, 54 Geo. 3, c. 56.
[81] See Birrell, *supra* note 15 at 144; Garnett, James & Davies, *supra* note 3 at 38.
[82] See *Dramatic Literary Property Act 1833*, 3 & 4 Will. c. 15. See also Garnett, James & Davies, *ibid.* at 39.

From 1837 to 1842, lobbying took place to extend the copyright scope. It was pleaded that basing the protection term on the natural life of the author was fundamentally unjust and denied the value of age and experience. On the other hand, it was argued that extending the protection term after the author's death deprived society of free access to works without any real advantages for authors.

The 1842 *Act* was a compromise between those positions. It stipulated that copyright protection would remain in effect until seven years after the author's death or 42 years following publication of the work, whichever was longer.[83] Registration with the Stationers' Company was no longer mandatory unless an action was brought against infringers.

British copyright is the source of both the Canadian and American copyright systems. In 1832, the Legislature of Lower Canada adopted a copyright statute.[84] However, because Canada was a dominion, the British 1842 *Copyright Act* applied despite this legislation.[85] The Canadian 1832 *Act* was repealed after the reunification of the provinces by a new law protecting authors living in the new province.[86] In 1867, the British Parliament gave the dominions the power to legislate on copyright matters,[87] and the first Canadian *Copyright Act* was enacted in 1868.[88] It was replaced in 1875 by the *Dominion Copyright Act*,[89] which was revised in 1906.[90] On 1 January 1924 a new *Copyright Act* came into force that was largely inspired by the *British Imperial Act* of 1911. [91]

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[83] See Birrell, *supra* note 15 at 58; Garnett, James & Davies, *ibid.* at 39.
[84] See *Act of 1832*, 2 Will. IV, c. 53.
[85] See Fox, *supra* note 12 at 30ff. See also *Durand & Cie* v. *La Patrie* (1960), 20 Fox Pat. C. 85(S.C.) at 92.
[86] See *Act for the Protection of Authors*, 4-5 Vic., c. 61 (1841).
[87] See *British North American Act*, S. 91, s. 23.
[88] See *Copyright Act*, 31 Vic., c. 54.
[89] See *Dominion Copyright Act*, 38 Vic., c. 54.
[90] See *Copyright Act*, R.S.C. 1906, c. 70.
[91] See 1921, c. 24; *Copyright Amendments Act*, 1923, c. 10, s. 5.

Patterson divides the American evolution of copyright into four stages:

> The stages are the states copyright status, the constitutional provision, the federal copyright Act of 1790, and the landmark case of American copyright law, *Wheaton v. Peters*, decided in 1834.[92]

From 1783 to 1787, it was the states' responsibility to adopt legislation regulating copyright.[93] The constitutional discussions of 1787 gave Congress the power over the copyright legislation,[94] and in 1790 it adopted the first federal *Copyright Act*.[95] This statute was amended in 1802[96] and was replaced by the first general revision of the American copyright laws in 1831.[97] Other general revisions were made in 1870[98] and 1909.[99]

2.3. Justifications

Some underlying principles have justified the copyright system. They can be classified in four different categories: (1) natural right, (2) stimulus for creativity, (3) just reward for labour, and (4) social requirements. This section defines those types of justifications and studies their influence on copyright.

The "natural right" philosophy holds that the author has an exclusive property right in his works because it is the result of his labour. Consequently, he must have exclusive control over the publication of his creations as well as a right to prevent any modifications or other attacks to his work's integrity.[100] The principal argument for this position is that the fruit of one's mechanical labour is

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[92] Patterson, *supra* note 15 at 180.
[93] See *ibid.* at 183ff.
[94] See *ibid.* at 193ff.
[95] See *Copyright Act*, 1 Stat. 124. See also Patterson, *ibid.* at 197ff.
[96] See *Copyright Amendments Act*, 2 Stat. 171.
[97] See *Copyright Act*, 4 Stat. 436[hereinaafter *Revision 1831*]. See also Patterson, *supra* note 15 at 201.
[98] See *Act of July* 8, 1870, c. 230, 16 Stat.198. See also Patterson, *ibid.* at 213.
[99] See *Act of March 4, 1909*, c. 320, 35 Stat. 1075, 17 U.S.C. §1ff [hereinaafter *Revision 1909*]. See also Patterson, *ibid.* at 213.
[100] See *Garnett, James & Davies*, *supra* note 3 at 29.

considered as his ownership.[101] One's intellectual product should be his property as other kinds of labour products are. For the supporters of this theory, copyright is not a statutory creation. The statutory provisions are only a recognition of a higher kind of right. Moreover, copyright is a natural right entitled to protection by the common law.[102]

Another way of justifying this natural right is through the extension of one's personality. The expression of the person is considered to be as much a part of herself as is her body. Therefore, the author should have complete control over her expression, and this control should be protected by law.[103] When intellectual property in a work is considered as a natural or innate right, as opposed to a statutory right, the legal protection recognized by the State should not require any formalities. Unpublished and published works should be protected from the moment of their creation.

The "just reward for labour" philosophy implies that the author deserves remuneration for the exploitation of his work. He is the one who has invested time and energy to create it, and therefore the investment has to be recompensed.[104] According to this point of view, the right of an author over his intellectual creations is a reward for the amount of time and effort he invested in his work. An important factor in determining its inclusion within the scope of copyright is the amount of labour invested in the work. This justification can be illustrated by the "sweat of the brow" theory.[105]

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[101] See Goldstein, *supra* note 17 at 26. See also S. Handa, *Understanding The Modern Law of Copyright in Canada* (D. Jur. Thesis, Montreal: McGill University, 1998) [unpublished] at 114.
[102] See Fox, *supra* note 12 at 2.
[103] See D. Johnston, D. Johnston & S. Handa, *Getting Canada Online: Understanding the Information Highway* (Toronto : Stoddart, 1995) at 170.
[104] See Garnett, James & Davies, *supra* note 3 at 29.
[105] The "sweat of the brow" theory was recently discussed in the following decisions: *Tele-Direct* v. *American Business Information*, [1998] 2 C.F. 22 at 37ff [hereinafter *Tele-Direct*]; *Feist.* v. *Rural Telephone Service*, 499 U.S. 340 (1991), online: FindLaw <http://www.findlaw.com> (date accessed: 22 September 1999)[hereinafter *Feist*].

The "stimulus to creativity" point of view supposes that the rewards given to authors increase the number of works produced. The guarantee of protection, the possibility to control copying and distribution of the work, and the right to be paid for the work encourages creation and increases the number of works available.[106] The fundamental assumption of this justification maintains that it is better to have access to a large number of works; this justification is not based on the quality but on the quantity of the creations available. This concept rewards the production of works without examining the effort invested in it or the product's attributes.

The "social requirement" theory maintains that authors should be encouraged to publish their works. A protection for authors is in the public interest and encourages the dissemination of works to the public.[107] Based on this theory, the protection of a creation begins with the publication of the work or by its availability to the public. Because unpublished books do not contribute to the collective knowledge, under this theory they should not be protected.

The copyright concept, as opposed to the droit d'auteur concept,[108] traditionally uses socioeconomic arguments, which are the "stimulus to creativity" and the "social requirement" arguments:

> In the United Kingdom, the justification for copyright legislation have centered historically on the economic and social arguments. While the need to protect the natural rights of the author and to encourage creativity by protecting the products of his mind has always been recognised, as well as the need to ensure an adequate reward for authors and creators for their efforts, the copyright system aims to encourage the

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[106] See Garnett, James & Davies, *supra* note 3 at 29; Goldstein, *supra* note 17 at 17.

[107] See Garnett, James & Davies, *ibid.* at 29.

[108] It is important to note, even though it will not be treated in this study, that "droit d'auteur" is another form of work protection. See generally A. Francon, *Le droit d'auteur: aspects internationaux et comparatifs* (Cowansville, Quebec: Editions Y. Blais, 1992); J. Raynard, *Droit d'auteur et conflits de lois: essai sur la nature juridique du droit d'auteur* (Paris: Litec, 1990); L.N. Cristea, *Contribution a l'étude du droit d'auteur : sa nature juridique a travers son évolution : étude de droit francais* (D. Jur. Thesis, Paris: Université de Paris, 1938) [unpublished]; A. Kerever, "Révolution francaise et droit d'auteur" 141 R.I.D.A. 3.

> dissemination of ideas and knowledge to the general public. There is also a concern to balance the interest of the author in protection of is work, on the one hand, with the interest of the public in access to works on the other.[109]

North American copyright has followed these same principles.[110] In the United States, the inclusion of copyright provisions in the Constitution was primarily justified by socioeconomic arguments. The plea for copyright was based on the promotion of learning.[111] Intellectual property, which promotes progress in the arts and science, was created to increase the number of works (stimulus to creativity) and to encourage authors to publish them (social requirement).

Canadian copyright is also a purely statutory concept.[112] The original purpose of copyright protection was to encourage culture "by providing incentives to authors and artists to produce worthy work, and to entrepreneurs to invest in the financing, production, and distribution of such work."[113] Consequently, Canadian copyright protection is also essentially based on economic justifications.

2.4. Definition of North American Copyright

What is copyright? How do we define its essence? Because they have different evolutions and realities, it is unusual to use the same definition for both Canadian and American copyright. This section compiles the information supplied by the different definitions, historical facts, and theoretical justifications and tries to present a global picture of North American copyright.

Based on the definitions provided previously and on its historical evolution, it can be assumed that modern copyright belongs to the author; protection is no longer initially attributed to printers or publishers. The initial beneficiary of the

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[109] *Ibid.* at 30.
[110] See Johnston, Johnston & Handa, *supra* note 103 at 170.
[111] See Patterson, *supra* note 15 at 193.
[112] See *Canadian Admiral* v. *Rediffusion Inc.* (1954) 20 C.P.R. 75 at 83 [hereinafter *Canadian Admiral*]. See also Fox, *supra* note 12 at 2; R.T. Hughes, *Hughes on Copyright and Industrial Design*, looseleaf (Toronto: Butterworths, 1984).

protection is the creator of the work, but he can assign his right to someone else.

However, in some situations, the *Act* initially grants the right to someone other than the author of the work. For example, the Canadian *Copyright Act* confers a presumption of copyright ownership to the Crown for works created under governmental direction.[114] Because North American copyright is considered as a privilege attributed by the government, this exception is easily justifiable and stems from the royal prerogative of the 17th century.

The provisions of the Canadian *Act* attributing the first copyright ownership to the employer of the author[115] is more problematic. This provision is justified by the economic philosophy supporting the copyright attribution. Giving an intellectual privilege to the employer encourages private companies to invest in the creation of works. Because companies are usually wealthier than individuals, this exception might tend to increase the production of works. Thus this exception is explained by the stimulus to creativity justification of copyright.[116]

Consequently, copyright would be a right habitually attributed to an author. However, it can also be attributed to someone else if it is consistent with the philosophy underlying the concept. Therefore, copyright is not characterized by ownership.

The subject of the right must be an intellectual creation, a "brain" product, having originality. This characteristic was examined recently by both the

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[113] D. Vaver, *Intellectual Property Law* (Concord, Ont :Irwin Law, 1997) at 22.
[114] See *Canadian Copyright Act*, *supra* note 1, s. 12. See also C. Brunet, *Le gouvernement du Québec et les droits d'auteurs de la couronne* (Québec: Ministère des Affaires culturelles (Gouvernement du Québec), 1983) at 4.
[115] See *Canadian Copyright Act*, *supra* note 1, s. 13(3).
[116] See Part 2.3, above, for more about this justification.

American and Canadian courts.[117] Because this thesis considers the application of copyright for future technologies, the "works" definition should not contain technological requirements. As exposed in the historical analysis, copyright was extended through the ages to include new techniques, and it would be a mistake to crystallize the evolutionary definition. For these reasons, the "works" definition should include the originality concept and apply to creations independent of their technical support.

The nature of the right might be defined as an exclusive protection against the distribution of works. This part of the definition contains two important concepts: the exclusive nature of the right and the distribution concept. The exclusive nature of the right attributed to the author is an important component of copyright. It is illustrated by the historical study of this notion and is evident in all the scholarly definitions provided in this thesis. The concept of distribution is an expression used only in this study. Because the use of the word "copy" might be a technical restriction, this definition prefers the concept of distribution since it seems easier to include public exhibitions and performances. The purpose of this approach is to obtain a broad definition of copyright protection that permits inclusion of all the rights linked with copyright.

Moral rights are new to North American copyright.[118] Both the United States and Canada are now members of the international *Berne Convention*, which obliges its members to include some moral rights in their copyright.[119] North American

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[117] See *Tele-Direct*, *supra* note 105 at 37ff; *Feist*, *supra* note 105.

[118] See Aide, *supra* note 17 at 221ff; R.D. Gibbens, "The Moral Rights of Artist and the Copyright Act Amendments" 15 Can. Bus. L.J. 441; J. Berg, "Moral Rights: A Legal, Historical and Anthropological Reappraisal" 6 I.P.J. 341; A.R. Rago, "The Moral Rights of the Author: A Comparative Study" 71 Dick L. Rev. 93; D. Vaver, "Author's Moral Rights in Canada" 14 I.I.C. 329; D. Vaver, "Author' Moral Rights and the Copyright Law Review Committee's Report: W(h)ither Such Rights Now?" Monash U.L. Rev. 284.

[119] *Berne Convention for the Protection of Literary and Artistic* Works, 9 September 1886, 828 U.N.T.S. 221. art. 6*bis*:

> (1) Independently of the author's economic rights, and even after the transfer of the said rights, the author shall have the right to claim authorship of the work and to object to any distortion, mutilation or other modification of, or other derogatory action in relation to, the said work, which would be prejudicial to his honor or reputation.

copyright provides to the author a right to the integrity of his works and a right to claim or to avoid the paternity of his creations.[120] To understand the influence of

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(2) The rights granted to the author in accordance with the preceding paragraph shall, after his death, be maintained, at least until the expiry of the economic rights, and shall be exercisable by the persons or institutions authorized by the legislation of the country where protection is claimed. However, those countries whose legislation, at the moment of their ratification of or accession to this Act, does not provide for the protection after the death of the author of all the rights set out in the preceding paragraph may provide that some of these rights may, after his death, cease to be maintained.

(3) The means of redress for safeguarding the rights granted by this Article shall be governed by the legislation of the country where protection is claimed.

See also Aide, *supra* note 17 at 221ff; *Contracting Parties of Treaties Administered by WIPO*, online: WIPO <http://www.wipo.org/eng/main.htm>(date accessed: 22 September 1999).

[120] *Canadian Copyright Act*, *supra* note 1, s. 14.1(1); However, the American protection for moral rights is limited to visual art. *American Copyright Act*, *supra* note 2, §106A:

Rights of certain authors to attribution and integrity

(a) Rights of Attribution and Integrity. - Subject to section 107 and independent of the exclusive rights provided in section 106, the author of a work of visual art -

(1) shall have the right -

(A) to claim authorship of that work, and

(B) to prevent the use of his or her name as the author of any work of visual art which he or she did not create;

(2) shall have the right to prevent the use of his or her name as the author of the work of visual art in the event of a distortion, mutilation, or other modification of the work which would be prejudicial to his or her honor or reputation; and

(3) subject to the limitations set forth in section 113(d), shall have the right -

(A) to prevent any intentional distortion, mutilation, or other modification of that work which would be prejudicial to his or her honor or reputation, and any intentional distortion, mutilation, or modification of that work is a violation of that right, and

(B) to prevent any destruction of a work of recognized stature, and any intentional or grossly negligent destruction of that work is a violation of that right.

(b) Scope and Exercise of Rights. - Only the author of a work of visual art has the rights conferred by subsection (a) in that work, whether or not the author is the copyright owner. The authors of a joint work of visual art are coowners of the rights conferred by subsection (a) in that work.

(c) Exceptions. - (1) The modification of a work of visual art which is a result of the passage of time or the inherent nature of the materials is not a distortion, mutilation, or other modification described in subsection (a)(3)(A).

(2) The modification of a work of visual art which is the result of conservation, or of the public presentation, including lighting and placement, of the work is not a destruction, distortion, mutilation, or other modification described in subsection (a)(3) unless the modification is caused by gross negligence.

(3) The rights described in paragraphs (1) and (2) of subsection (a) shall not apply to any reproduction, depiction, portrayal, or other use of a work in, upon, or in any connection with any item described in subparagraph (A) or (B) of the definition of "work of visual art" in section 101, and any such reproduction, depiction, portrayal, or other use of a work is not a destruction, distortion, mutilation, or other modification described in paragraph (3) of subsection (a).

(d) Duration of Rights. - (1) With respect to works of visual art created on or after the effective date set forth in section 610(a) of the Visual Artists Rights Act of 1990, the

copyright on the technological evolution, the moral right concept must be included in the copyright definition.

Finally, the definition of copyright used in this study will be: an exclusive right against the distribution of an intellectual creation given to an author or to someone else. The attribution of the right to someone else should however be consistent with the justifications underlying the copyright concept or with its history. The copyright privilege also includes the following moral rights: the right to be recognized as the creator of the work, the right to remain anonymous, and the right to the work's integrity.

This definition does not pretend to be the official general interpretation of copyright in North America. Canadian and American copyrights are two different and complex systems. However, this definition, based on the common features of both systems, provides an interesting picture of the North American reality of

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rights conferred by subsection (a) shall endure for a term consisting of the life of the author.
(2) With respect to works of visual art created before the effective date set forth in section 610(a) of the Visual Artists Rights Act of 1990, but title to which has not, as of such effective date, been transferred from the author, the rights conferred by subsection (a) shall be coextensive with, and shall expire at the same time as, the rights conferred by section 106.
(3) In the case of a joint work prepared by two or more authors, the rights conferred by subsection (a) shall endure for a term consisting of the life of the last surviving author.
(4) All terms of the rights conferred by subsection (a) run to the end of the calendar year in which they would otherwise expire.
(e) Transfer and Waiver. - (1) The rights conferred by subsection (a) may not be transferred, but those rights may be waived if the author expressly agrees to such waiver in a written instrument signed by the author. Such instrument shall specifically identify the work, and uses of that work, to which the waiver applies, and the waiver shall apply only to the work and uses so identified. In the case of a joint work prepared by two or more authors, a waiver of rights under this paragraph made by one such author waives such rights for all such authors.
(2) Ownership of the rights conferred by subsection (a) with respect to a work of visual art is distinct from ownership of any copy of that work, or of a copyright or any exclusive right under a copyright in that work. Transfer of ownership of any copy of a work of visual art, or of a copyright or any exclusive right under a copyright, shall not constitute a waiver of the rights conferred by subsection (a). Except as may otherwise be agreed by the author in a written instrument signed by the author, a waiver of the rights conferred by subsection (a) with respect to a work of visual art shall not constitute a

work protection. It will be the basis for understanding the influence of copyright on the evolution of technology.

3. THE HISTORICAL RELATION BETWEEN COPYRIGHT AND TECHNOLOGY

Since the introduction of copyright, new technologies have emerged. Inventors have found new ways of reproducing works, and authors have attempted to extend copyright to protect against such reproductions. Many times, copyright has been forced to address new technologies. This chapter examines some of the most influential technologies having appeared during the last century and analyzes copyright's response to their existence. The devices described herein were chosen because, when created, they introduced new ways of copying. Some technologies, like photography, were also a new form of work.

This chapter first looks at the evolution of each technology. This factual study might be surprising in a law thesis, but it is essential for a complete understanding of copyright law since it permits us to grasp the process by which a work is copied or transformed and the social impact of each new device.

The description of each machine and its invention is followed by the response of North American copyright, which most often originated in United States, but sometimes also appeared in Canada. This study evaluates the most influential reaction to the technology being examined, no matter in which country it happened.

3.1. Gutenberg's Printing Press

In the 15th century, the need for documentation increased. Governments were extending their jurisdictions, their administration was becoming more complex, and more trade was developing. Scribal monks, sanctioned by the Church, had overseen the maintenance and hand-copying of sacred texts for centuries, but

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transfer of ownership of any copy of that work, or of ownership of a copyright or of any exclusive right under a copyright in that work."

they were unable to keep up with the demand. Consequently, the secular world began to foster its own version of the copyist profession, and many new writing shops opened.

Johannes Gutenberg, a businessman from Mainz, in southern Germany, borrowed money to develop a technology that could address the growing need for rapid and cheap production of written documents. He developed the printing press by combining features from machinery used to produce textiles, paper and wine. His most significant innovation was movable metal type:

> Each letter was carved into the end of a steel punch which was then hammered into a copper blank. The copper impression was inserted into a mold and a molten alloy made of lead, antimony and bismuth was poured in. The alloy cooled quickly and the resulting reverse image of the letter attached to a lead base could be handled in minutes. The width of the lead base varied according to the letter's size (for example, the base of an "i" would not be nearly as wide as the base of a "w"). This emphasized the visual impact of words and clusters of words rather than evenly spaced letters. This principle lent an aesthetic elegance and sophistication to what seemed to many to be the magically perfect regularity of a printed page. [121]

Gutenberg's strong market was the selling of indulgences, those slips of paper offering written dispensations from sin that the Church was selling to fund its projects. He also designed a Latin print Bible, which became his most famous work. Despite the dramatic success of his invention, Gutenberg defaulted on his loan, and so he lost his printing establishment and his techniques were made public;[122] this situation explains the rapid and widespread use of his invention.

In 1476, William Caxton established England's first printing press. Caxton had been a prolific translator and found the printing press to be a good way to promote popular literature. Caxton printed and distributed a wide variety of

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[121] G. Rubinstein, *Gutenberg and the Historical Moment in Western Europe*, online: Communication and Information Technologies course (University of Sofia (Bulgaria)) <http://sparc10.fmi.uni-sofia.bg/cit/intro/printhis/print~1.htm#Gutenberg> (date accessed: 5 August 1999).
[122] See *ibid.*

attractive titles. He realized that English suffered from so much regional variation that many people could not communicate with others in their own language. Consequently, he determined a standard for the diction, spelling, and usage for all the books he printed. In fact, Caxton's work as an editor and printer helped to standardize the English language.[123]

Stephen Daye brought the first printing press to North America in 1638. Based in Cambridge, Massachusetts, Daye and his son Matthew, a printer's apprentice, printed a broadside and an almanac in their first year of operation. In 1640, they produced 1700 copies of the *Bay Psalm Book*, the first book to be printed in the colonies.[124]

The historical relation between the printing press and copyright protection has already been presented in the first chapter and thus will not be discussed again here.[125] However, it is important to underline that the machine was so popular and useful that a legal system had to be created to regulate the copying of works.

Gutenberg's printing press had an important influence on copyright history because the appearance of the machine created the need for the conception of copyright. But copyright also influenced the device's distribution and utilization. For example, in 1533, when Henry VIII sanctioned a statute preventing the printing of books in England by foreign printers, he certainly influenced the utilization and distribution of the printing press.[126]

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[123] See *ibid.*
[124] See *ibid.*; G.F. Henderson, "Canadian Copyright Law in the Context of American-Canadian Relations" (1977) 35 C.P.R. (2d) 67.
[125] See Part 2.2, above.
[126] See Section 2.2, above.

North American copyright, which is based on British copyright law, also controlled unauthorized copies of copyrighted books.[127] However, when copyright began in North America,[128] the printing press had already existed for more than three hundred years and was a well developed and widely disseminated apparatus. Therefore, it was late for North American copyright to delay the device's development.

Moreover, the use of the device was encouraged by the American legislature. In 1891, the American government amended the *Copyright Act* to include foreign authors within the copyright scope, on the condition that the work be typeset in the United States.[129] This provision probably encouraged the use of the printing press in North America, annulling the negative effect of the printing limitation inherent within copyright provisions.

Consequently, considering the degree of development of the technology and the provision of North American copyright, it can be assumed that the latter did not delay the development of the printing press. This conclusion is illustrated by the well developed publishing industry existing throughout the 20th century.[130]

3.2. Photography

Photography, the first technology to challenge modern North American copyright, combined two distinct scientific processes already having been in existence for hundreds of years.[131] The first of these processes was optical (the

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[127] See *ibid.*

[128] The first form of copyright protection appeared in 1783. See *ibid.*

[129] See Goldstein, *supra* note 17 at 134; Handa, *supra* note 101 at 65.

[130] This conclusion is illustrated by the success of entreprises like *Amazon.com* and the recent Statistics Canada report that affirms that in Canada, sales in 1996-1997 by English language publishing firms totaled $1,991,565. See *Net sales in Canada of publishing firms and exclusive agents*, online: Statistics Canada <http://www.statcan.ca/english/Pgdb/People/Culture/arts01a.htm> (date accessed: 3 November 1999); *Welcome to Amazon.com*, online: Amazon.com <http://www.amazon.com> (date accessed: 3 November 1999).

[131] See R. Leggat, "The Beginning of Photography" (1999) online: The Royal Photographic Society <http://www.kbnet.co.uk/rleggat/photo/history/beginnin.htm> (last modified: 11 January 1999).

dark room system also named Camera Obscura), while the second was chemical (some substances change color with light).[132]

The first successful picture was produced in 1827 by Nicephore Niépce, using a material that hardened when exposed to light.[133] The picture required an exposure of eight hours. On 4 January 1829, Niépce decided to begin a partnership with Louis Daguerre. Niépce died four years later, but Daguerre continued to experiment. Soon, he had discovered a way of developing photographic plates that reduced exposure time from eight hours to half an hour. He also discovered that an image could be made permanent if immersed in salt.

Daguerre named the process "daguerreotype". This process was expensive, and only one copy of each picture could be made.[134] From a copyright point of view, that could be regarded as an advantage: the owner of the portrait could be certain that he had a piece of art that could not be duplicated. If, however, two copies were required, the only way of coping was to use two cameras side by side. There was, therefore, a growing need for a means of copying pictures that "daguerreotype" could never satisfy.

The answer to this problem was provided by a rival of "daguerreotype", "calotype", invented by William Henry Fox Talbot.[135] "Calotype" used the paper negative, which had become available in August 1835. The great advantage of Talbot's method was that an unlimited number of positive prints could be made. However, the negative was small and of poor quality compared with the images produced by the daguerreotype process. Nevertheless, by 1840, Talbot had made some significant improvements.

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[132] See K. Macgowan, *Behind the Screen: The History and Techniques of the Motion Pictures* (New York: Delacorte Press Book, 1965) at 40.
[133] See *ibid.* at 42; Leggat, *supra* note 131.
[134] See Leggat, *ibid.*; Macgowan, *ibid.* at 43.
[135] See *ibid.*; Macgowan, *supra* note 132 at 42.

The expansion of photographic establishments reflected photography's growing popularity. In 1850, there were already 77 photographic galleries in New York alone. The demand for photographs was such that Charles Baudelaire, a well-known poet of the period and a critic of the medium, commented: "[O]ur squalid society has rushed, Narcissus to a man, to gloat at its trivial image on a scrap of metal."[136]

Talbot's photographs were on paper, and inevitably the imperfections of the paper marred the image. Several photographers experimented with glass as a base for negatives, but the problem was to make the silver solution stick to the polished surface of the glass. In 1848, a cousin of Nicephore Niépce, Abel Niépce de Saint-Victor, perfected a process of covering a glass plate with egg white sensitised with potassium iodide, and washed with an acid solution of silver nitrate.[137] This new process made for very fine detail and much higher quality. However, it was an extremely slow process. Photographs printed on this substance were usually of architecture and landscapes because portraiture was simply not possible.

In 1851, a new era in photography was introduced by Frederick Scott Archer, who developed the Collodion process.[138] This process was much faster than conventional methods as it reduced exposure time to two or three seconds. In addition, the Collodion process was much cheaper than "daguerreotype". However, this process required a considerable amount of equipment on location. Moreover, there were various attempts to preserve exposed plates in wet condition for development at a more convenient time and place, and the preservatives used lessened the sensitivity of the material.

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[136] Leggat, *ibid.*
[137] See *ibid.*
[138] See *ibid.*

The next major improvement came in 1871, when Dr. Richard Maddox discovered a way to use gelatin instead of glass as a base for the photographic plate.[139] This led to the utilization of the dry plate process. Dry plates could be developed much more quickly than any previous technique. The introduction of the dry plate process marked a turning point. No longer did one need wet plates or a darkroom tent.

Celluloid was invented in the early 1860's, and John Carbutt persuaded a manufacturer to produce very thin celluloid as a backing for sensitive material.[140] This improvement led to the introduction, in 1888, of the box camera by George Eastman. Specialized knowledge was not required when taking photographs.

It took forty years for North American copyright to react to photographic technology. In the early 1860's, photography was a lucrative business. People wanted pictures not only of themselves but also of celebrities and politicians. With the evolution of the art, it was now possible to make numerous perfect copies of a picture. Considering those conditions, photographers pleaded for copyright protection.

The United States legislature was the first to respond and, in March 1865, Congress amended the *Copyright Act* to include photographic prints and negatives in the class of copyrightable works.[141] The protection given to photography was the same as for other types of work, and the *Act* proceeded by including photographs in the general list of protected works.[142]

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[139] See *ibid.*

[140] See *ibid.*

[141] See *An Act Supplemental to an Act entitled "An Act to Amend the Severals Acts Respecting Copyright*, 13 U.S. Stat. at L. 540 (1865), s. 1. The Canadian legislator followed in 1868. *Acte concernant la propriété littéraire et artistique, 1968*, 31 Vic., c. 54, art. 3. See Y. Gendreau, *La protection des photographies en droit d'auteur français, américain, brithannique et canadien* (Paris: Bibliothèque de droit privé, 1994) at 6, n. 19 [hereinafter *Protection des photographies*]; Goldstein, *supra* note 17 at 58.

[142] See *Protection des photographies, ibid.* at 3.

In 1885, the American Supreme Court addressed the constitutionality of this protection in *Burrow-Giles Lithographic Co.* v. *Sarony.*[143] Napoleon Sarony was a well-known New York photographer who had taken pictures of Oscar Wilde. Burrow-Giles Lithographic Company had reproduced one of these pictures and had sold 85,000 copies without the photographer's consent. Sarony sued the printer for copyright infringement.

The defendant pleaded the unconstitutionality of the legal disposition. His first argument was that because a photograph is an image, it cannot be included in the definition of "writing" mentioned in the Constitution. The Supreme Court dismissed this argument. The Court examined the first *Copyright Act of 1790* and the *Act of 1802*. Both protected not only books but also maps, charts, designs, engravings, etchings, cuts, and other prints. The Court underlined that, upon the men who participated in the redaction of those statutes, many were members of the convention that framed the constitutional disposition concerning copyright. Based on the broad interpretation they gave to "writing", and considering that this approach had not been disputed during a period of nearly a century, the Supreme Court concluded that the constitutional provision was not limited to books only, or writing, in the limited sense of a book and its author.[144]

The Court interpreted constitutional protection for "writing" as referring to the literary productions of authors, including all forms of writing, printing, engravings, etchings, etc., by which the ideas in the mind of the author are given visible expression. The Court concluded that the only reason photographs were not included in the extended list in the *Act of 1802* was simply because the technology did not exist at that time. Therefore, the Court stated that the Constitution was broad enough to cover an *Act* authorizing copyright for

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[143] See 111 U.S. 53 (1884) online: FindLaw <http://www.findla143w.com/casecode/supreme.html> (date accessed: 11 August 1999).
[144] See *ibid.*

photographs, as long as works made using this technology were the original intellectual conceptions of the author.[145]

The second argument of Burrow-Giles Lithographic was that a photograph is a mirror of reality without original input by the author. The Court again held in favor of the plaintiff:

> The third finding of facts says, in regard to the photograph in question, that it is a 'useful, new, harmonious, characteristic, and graceful picture, and that plaintiff made the same ... entirely from his own original mental conception, to which he gave visible form by posing the said Oscar Wilde in front of the camera, selecting and arranging the costume, draperies, and other various accessories in said photograph, arranging the subject so as to present graceful outlines, arranging and disposing the light and shade, suggesting and evoking the desired expression, and from such disposition, arrangement, or representation, made entirely by plaintiff, he produced the picture in suit.' These findings, we think, show this photograph to be an original work of art, the product of plaintiff's intellectual invention, of which plaintiff is the author, and of a class of inventions for which the constitution intended that congress should secure to him the exclusive right to use, publish, and sell, as it has done by section 4952 of the Revised Statutes.[146]

The Supreme Court decided unanimously in favor of the photographer.[147] This strong decision secured copyright protection for photography, but one doubt still remained: Can a commercial product be protected by copyright?[148] A long line of decisions had supposed this restriction, and since photographs were mostly made for commercial purposes, a legal uncertainty existed.[149]

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[145] See *ibid.*
[146] *Ibid.*
[147] For an explanation of the court approach, see W. Hurst, "Technological Change and Statutory Interpretation" (1968) 2 Wisc. L. Rev. 556.
[148] See Goldstein, *supra* note 17 at 60.
[149] See *ibid.* at 60. See also *Trade Mark Cases*, 100 U.S. 82 (1879).

The Supreme Court in *Bleistein* v. *Donaldson Lithographing*[150] answered this question in the affirmative. The plaintiff, George Bleistein, was a printer. His employees had designed advertising posters, based on pictures, for the promotion of a circus. The posters contained a portrait of Wallace, the circus proprietor, in the corner, and lettering bearing some slight relation to the scheme of decoration, indicating the subject of the design and the fact that reality could be seen at the circus. The defendant, Donaldson Lithographing, had copied, in reduced form, three of the posters. Bleistein sued Donaldson for copyright infringement.

The trial court and appeals court rejected the plaintiff's pretensions on the basis that it was a commercial product and that commercial products were not protected by copyright.[151] The Supreme Court stated differently, underlining that a picture used for advertisement is nevertheless a picture, and therefore a subject of copyright. Excluding from the copyright scope pictures made for advertising implied excluding works based on their subject. The Court guarded against this subjective approach, stating:

> It would be a dangerous undertaking for persons trained only to the law to constitute themselves final judges of the worth of pictorial illustrations, outside of the narrowest and most obvious limits. At the one extreme, some works of genius would be sure to miss appreciation. Their very novelty would make them repulsive until the public had learned the new language in which their author spoke. It may be more than doubted, for instance, whether the etchings of Goya or the paintings of Manet would have been sure of protection when seen for the first time. At the other end, copyright would be denied to which appealed to a public less educated than the judge. Yet if they command the interest of any public, they have a commercial value,-it would be bold to say that they have not an aesthetic and educational value,- and the taste of any public is not to be treated with contempt. It is an ultimate fact for the moment, whatever may be

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[150] See 188 U.S. 239 (1903) online: FindLaw <http://www.findlaw.com/casecode/supreme.html> (date accessed: 11 August 1999).

[151] See *Lithographing* v. *Donaldson Lithographing*, 44 C.C.A. 296, 104 Fed. 993.

> our hopes for a change. That these pictures had their worth and their success is sufficiently shown by the desire to reproduce them without regard to the plaintiffs' rights.[152]

The *Bleistein* decision secured the commercial use of pictures. Photographers became interested in the popular use of their art and subsequently increased production for advertising campaigns and the like. The *Burrow-Giles* and the *Bleistein* decisions confirmed that photography was entitled to receive copyright protection in North America.

At first copyright seemingly had no influence on photographic technology. For forty years, copyright ignored the new technique and photographs were taken and copied without restriction. The consecration of photographs as a piece of art, or a copyrighted work, probably increased the popularity of the technique by giving it a type of nobility, of recognizability.[153] It certainly afforded more security to photographers by giving them exclusive control over their creations and distribution of such works. Those elements contributed to the popularity of the developing medium.

However, the greatest impact on the use of the photography was probably made by the *Bleistein* decision,[154] which confirmed protection for photographs taken for commercial purposes. The decision increased advantages in producing pictures for advertisements. High-level photographers became more interested in supplying pictures for promotional purposes since they could control the distribution of their work. Advertisers were ready to pay more for high quality photographs because they could exclusively use the work. A lucrative industry was created. Photographs were seen and known by the general public. Consequently, consumers became aware of the technology and began to use it.

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[152] *Ibid.*
[153] See *supra* note 141 and accompanying text.
[154] See *supra* note 150 and accompanying text.

Nowadays, photography remains a popular technique used by a large part of the North American population.[155]

Therefore, North American copyright did not restrain the development of photography. On the contrary, it favored its distribution and use by protecting works made using this technique. Even though it took a long time for legal protection to be enacted, copyright had, in this case, a positive influence on technological development.

3.3. Player-piano

Still famous because of Western movies, the player-piano was the first mechanical device invented to reproduce music. It can be described as a:

> Piano powered by foot-pedals or a hand-crank, and containing an added built-in mechanism which operates the piano keys in lieu of a human pianist. Previously arranged musical data, stored as holes in punched paper or pins in a cylinder, is read by a data reader mechanism which ultimately operates the piano hammers. "Barrel Piano" or "Roller Piano" is the name for the earliest form of player piano. It is powered by a hand-crank and controlled by a pinned cylinder which resembles a biscuit roller the size of a tree trunk! The hammer velocity is constant in a barrel piano; the only operator control is the cranking speed, which determines the music speed.[156]

In 1863, Forneaux, a Frenchman, patented the "Pianista", which appears to be the first player-piano to operate on pneumatic principles.[157] This invention necessitated the use of the piano roll, which was subsequently developed.

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[155] This is illustrated by the sales of 3,580 billions, only for the third quarter of 1999, made Kodak one of the most important supplier of photographic materials. See *Kodak Reports 1999 Third Quarter Results* online: Kodak <http://www.kodak.com/US/en/corp/investorCenter/earningsReleases.shtml> (last modified: 18 October 1999).

[156] R. Rhodes, *Player Pianos* (1998) online: Player Piano Company <http://www.player-care.com/index98.html> (last modified: 6 June 1998).

[157] See K.A. Holliday, *Reproducing Pianos Past and Present* (Lewinston New York: Edwin Mellen Press, 1989) at 3; *History of Piano Rolls* online: Ozemail <http://www.ozemail.com.au/~pianola/rollhist.htm> (date accessed: 15 August 1999) [hereinafter *History of Piano Rolls*]. " The pneumatic mechanism is built-in, with a "data reader" for a perforated paper "music roll". The data reader has a speed governor with a "Tempo" knob for operator control of the music speed. Operating power is from foot pedals which pump a large vacuum bellows; the more vigorously that the pedals are pumped, the louder is the sound." Rhodes, *supra* note 156.

It was Elias Parkman Needham who originated the idea of the perforated sheet of paper allowing the release of musical tones as the perforations passed over the openings.[158] In 1886, George B. Kelly developed the slide-valve wind motor, and this device was universally used to rotate the drive spool holding the roll of paper music in player-pianos.[159]

In the United States, W.B. Tremaine and his son began manufacturing automatic playing musical instruments.[160] Their distribution of the "Pianola" was a great success, and soon it became a generic term applied to all types of player-pianos.

The beginning of the 20th century saw the standardization of roll sizes and perforation spacing, permitting a mass penetration of the market.[161] The interest in this type of technology is easily understandable. Before this device, the only way to have access to music was by buying sheet music. Consequently, access to musical entertainment was limited to those who could play the music or see a public performance. With the player-piano, everyone, musically skilled or not, could listen at home to the sounds they liked at the moment they wanted to hear it. Teenagers and young adults were buying all the latest popular tunes. It was the beginning of the music industry as we know it today.

The next step was to reproduce all the nuances that the human artist could put into his playing. The Welte Organisation of Freiburg, Germany made the Welte-Mignon expression piano, and by 1905, the company was getting various composers and pianists of the day to record paper rolls having not only

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[158] See *History of Piano Rolls*, *ibid.*
[159] See *ibid.*; Holliday, *supra* note 157 at 3.
[160] See *History of Piano Rolls*, *ibid.*
[161] See *ibid.*; Holliday, *supra* note 157 at 4.

perforations recording the notes played, but additional perforations to record the artist's expression in his interpretation of the piece played.[162]

These expression player-pianos, where they remain operational, are historically very significant as they are often the only means for today's generation to hear the performances of some of the musical giants from the turn of the century. These player-piano performances are still used to produce CDs.[163]

The Great Depression marked a decrease in the sales of player-pianos as people were no longer able to afford this type of private entertainment. However, with the development of silent movies, player-pianos were used as an accompaniment.[164] This utilization led to an extension of the player-piano, which, with pipe organs and effects made to create other sound effects, was now able to recreate the mood of the film. But even this use declined when movies became "talkies" as music now came with the film and was usually replayed through elaborate electrical reproduction devices.[165]

North American copyright protected traditional sheet music from 1831 onwards.[166] However, there were no similar provisions for mechanically-reproduced music. Was a piano roll a reproduction of music and thus a copyright infringement? It is one thing to consider that a exact copy of a book infringes copyright, but it is something else to recognize that the piano roll, a sheet of paper with tiny holes, is a reproduction of a copyrighted music sheet. In 1907, when the popularity of the player-piano was at its peak, the American Supreme Court was faced with this question.[167]

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[162] See *History of Piano Rolls*, *ibid.*; Rhodes, *supra* note 156; Holliday, *ibid.* at 5.
[163] See *History of Piano Rolls*, *ibid.*
[164] See *ibid.*
[165] See *ibid.*
[166] See *Revision 1831*, *supra* note 97. See also Goldstein, *supra* note 17 at 64.
[167] See *White-Smith Music Pub. Co.* v. *Apollo Co.*, 209 U.S. 1 (1908) online: FindLaw <http://www.findlaw.com/casecode/supreme.html> (date accessed: 16 August 1999) [hereinafter *White-Smith*].

White-Smith Music Publishers, representing the composers of *Little Cotton Dolly* and *Kentucky Babe*, two pieces of music that had already been published in the form of sheet music, sued Apollo, a dealer of piano players and perforated rolls of music, for copyright infringement. The proof disclosed that certain of the defendant's rolls, used in connection with the player-piano, reproduced in sound the two already-copyrighted pieces.

White-Smith Music Publishers alleged that the reproduction in the perforated rolls infringed copyright, and Apollo argued that it did not. The Court first defined the technology:

> Without entering into a detailed discussion of the mechanical construction of such instruments and rolls, it is enough to say that they are what has become familiar to the public in the form of mechanical attachments to pianos, such as the pianola, and the musical rolls consist of perforated sheets, which are passed over ducts connected with the operating parts of the mechanism in such manner that the same are kept sealed until, by means of perforations in the rolls, air pressure is admitted to the ducts which operate the pneumatic devices to sound the notes. This is done with the aid of an operator, upon whose skill and experience the success of the rendition largely depends. As the roll is drawn over the tracker board the notes are sounded as the perforations admit the atmospheric pressure, the perforations having been so arranged that the effect is to produce the melody or tune for which the roll has been cut.
>
> Speaking in a general way, it may be said that these rolls are made in three ways. First. With the score or staff notation before him the arranger, with the aid of a rule or guide and a graduated schedule, marks the position and size of the perforations on a sheet of paper to correspond to the order of notes in the composition. The marked sheet is then passed into the hands of an operator who cuts the apertures, by hand, in the paper. This perforated sheet is inspected and corrected, and when corrected is called 'the original.' This original is used as a stencil and by passing ink rollers over it a pattern is prepared. The stenciled perforations are then cut, producing the master or templet. The master is placed in the perforating machine and reproductions thereof obtained, which are the perforated rolls in question. Expression marks are separately copied on the perforated music

> sheets by means of rubber stamps. Second. A perforated music roll made by another manufacturer may be used from which to make a new record. Third. By playing upon a piano to which is attached an automatic recording device producing a perforated matrix from which a perforated music roll may be produced.[168]

The Court reviewed the jurisprudence and concluded that, even if the question was never properly asked, existing *obiter dicta* uniformly considered that the piano rolls were not a copyright infringement. It also remarked that Congress was aware of the situation and had chosen not to alter the *Copyright Act*.

Moreover, the Court stated that the *Berne Convention*[169] did not provide protection against the mechanical reproduction of a work. Because the United States provided reciprocal protection to foreign countries, the Supreme Court concluded that "it could not have been the intention of Congress to give to foreign citizens and composers advantages in our country which, according to that convention, were to be denied to our citizens abroad."[170]

Based on the fact that copyright is a statutory right, the Supreme Court emphasized that a musical composition is an intellectual creation that first exists in the mind of the composer, even though he communicates it for the first time on a musical instrument. This creation is not protected by copyright until it is put in a form that others can see and read. The Court underlined that the statute does not provide for the protection of the intellectual conception, however valuable such conception may be. It only protects a composer of a tangible work against its unauthorized publication and duplication.[171]

The Court also wondered about the nature of the perforated rolls. Testimonies revealed that even those skilled in the making of piano rolls were unable to read

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[168] *Ibid.*
[169] See *Berne Convention*, *supra* note 119.
[170] *White-Smith*, *supra* note 167.
[171] See *ibid.*

them as musical compositions, contrary to staff notations read by performers. Therefore, because it was not in a form that others could see and read, the Court stated that piano rolls were not protected by copyright. Based on this finding, the Court concluded that even though perforated rolls were part of a machine and that, when duly applied and properly operated in connection with the mechanism to which they were adapted, they produced musical tones in harmonious combinations, they could not be considered as copies of original musical works within the meaning of the *Copyright Act*.

Conscious of the economic consequence of its decision, Justice Day, writing for the majority, added:

> It may be true that the use of these perforated rolls, in the absence of statutory protection, enables the manufacturers thereof to enjoy the use of musical compositions for which they pay no value. But such considerations properly address themselves to the legislative, and not to the judicial, branch of the government. As the Act of Congress now stands we believe it does not include these records as copies or publications of the copyrighted music involved in these cases.[172]

The message was heard by Congress, which endorsed a bill the following year that included piano rolls in the copyright scope and restricted unauthorized mechanical reproductions of musical compositions.[173] Fearing the creation of monopolies in the music industry, the bill submitted the right to a compulsory license: Once a copyright owner authorized the mechanical reproduction of his musical composition, any other company was free to make its own recording of the composition simply by paying the copyright owner two cents for each record

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[172] *Ibid.* In Canada, the Court of Appeals made a similar decision. See *Boosey* v. *Whight*, [1900] 1 Ch. 122. See also Fox, *supra* note 12 at 178.

[173] See *Revision 1909*, *supra* note 99. See also Goldstein, *supra* note 17 at 67. In Canada, protection for piano rolls was included in the *Copyright Act of 1921*, *supra* note 91, s. 3(1)(d). See also Fox, *ibid.* at 179.

it produced.[174] Also, North American copyright was extended to protect against unauthorized copies of a musical work in a piano roll form.[175]

In scrutinizing the history of the player-piano, it is not until the Great Depression in 1929 that a diminution of the device's popularity becomes evident.[176] Until this event, interest in the piano-player was growing and improvements were continually made to the device. The inclusion, in 1909, of piano rolls in the copyright scope appears not to have affected, either positively or negatively, development or availability of the instrument.

The obligation to pay royalties to composers for the utilization of their works surely increased the cost of producing piano rolls. Piano-player manufacturers had to negotiate with the composer before adding the song to their repertory. This implied that more time, energy, and money had to be invested in the production of "hits".

However, since the player-piano was already highly popular, the costs were probably covered by the price consumers were willing to pay for piano rolls. Because they had already invested money in the instrument, consumers were still interested in buying piano rolls even if it was at a higher price. The technology was already known and widely distributed. The growing market probably decreased the initial price of the rolls and, at the same time, annulled the inflation resulting from copyright protection. Moreover, the protection given to piano rolls probably also canceled out the negative effects of restricting the reproduction of musical compositions.

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[174] See *Revision 1909*, *ibid.*; Goldstein, *ibid.*
[175] See *ibid.*
[176] See *History of Piano Rolls*, *supra* note 157; Rhodes, *supra* note 156; Holliday, *supra* note 157 at 7.

Therefore, it appears that copyright did not influence player-piano technology. The economic depression and the technological evolution were the major factors influencing development of the invention.

3.4. Motion Picture

In 1839, because photography was gaining popularity, the scene was set for the creation of motion pictures. The concept of moving images as entertainment was not a new one. Magic lanterns had already been employed to project images printed on glass slides, and the use of levers gave the impression that these images were moving.[177] Another available mechanism, the "phenakistiscope", consisting of a disc that contained pictures of successive phases of movement, could be turned to simulate movements.[178] The "zoopraxiscope" was also a device that projected a series of images in successive phases of movements. These images were obtained through the use of multiple cameras.

> A fundamental principle of motion-picture photography and projection is that the picture must, for a fraction of the second, be motionless behind the objective during exposition and projection, to then pass by in phases. The human eye recognises and preserves the picture in that fraction of the second, with the film rolling on and the objective opening up again, and this impression or visual phenomenon vividly lives on in the human brain although no new impression is made on the retina between two pictures or two phases of motion. The human eye, however, compensates for this by perceiving the motion to be in continuity and not in phases.[179]

The motion picture system began with the invention by Thomas Edison of a camera capable of recording successive images. In 1888, Edison filed a caveat with the American Patent Office describing his ideas for a device that would "do for the eye what the phonograph does for the ear": record and reproduce

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[177] See Macgowan, *supra* note 132 at 26.
[178] See *ibid.*

objects in motion.[180] Edison called the invention a "kinetoscope," using the Greek words "kineto" meaning "movement" and "scopos" meaning "to watch."[181]

After a lot of experimentation, a prototype of the kinetoscope was completed in 1892.[182]

> It consisted of an upright wooden cabinet, 18 in. x 27 in. x 4 ft. high, with a peephole with magnifying lenses in the top...Inside the box the film, in a continuous band of approximately 50 feet, was arranged around a series of spools. A large, electrically driven sprocket wheel at the top of the box engaged corresponding sprocket holes punched in the edges of the film, which was thus drawn under the lens at a continuous rate. Beneath the film was an electric lamp, and between the lamp and the film a revolving shutter with a narrow slit. As each frame passed under the lens, the shutter permitted a flash of light so brief that the frame appeared to be frozen. This rapid series of apparently still frames appeared, thanks to the persistence of vision phenomenon, as a moving image.[183]

For the new invention to be popular, films were needed, and thus Edison decided to build a motion picture production studio. The studio had a roof that could be opened to admit sunlight for illumination. To keep it aligned with the sun, the building was mounted on a rotating pivot. The first motion picture made in this installation was deposited for copyright at the Copyright Office in August 1893 as a series of positive photographic prints rather than on celluloid film.[184]

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[179] *The Discovery of Motion Picture Photographing*, online: Filmkultura <http://www.filmkultura.iif.hu:8080/articles/teaching/discovery.en.html> (date accessed: 15 August 1999).
[180] *Ibid.*
[181] *Origins of Motion Pictures--the Kinetoscope*, online: Library of Congress <http://learning.loc.gov/ammem/edhtml/edmvhist.html#O> (date accessed: 15 August 1999). [hereinafter *Kinetoscope*]; Macgowan, *supra* note 132 at 68.
[182] See J.A.L. Sterling, *Intellectual Property Rights In Sound Recordings, Films and Video* (Toronto: Carswell, 1992) at 24.
[183] D. Robinson, *From Peep Show to Palace: The Birth of American Film*. (New York: Columbia University Press, 1996), cited in *Kinetoscope*, *supra* note 181.
[184] See *Kinetoscope*, *ibid.*

In 1894, the first "kinetoscope parlor" was inaugurated in New York. Five machines were placed in a line and customers could view the films in each for a total of 25 cents. Kinetoscope parlors soon opened around the United States.

The next step was the invention of the projector, which was more economically feasible since only one machine was needed to show the movie to many spectators. This device was first presented publicly in April 1895.[185]

That same year, two brothers, August and Louis Lumiere, from Lyon, France, patented the machine that would revolutionize the motion-picture industry. Their "cinematograph" was able to perform three actions: making moving picture photographs, projecting them, and making prints from the negative. The new machine was made public on 22 March 1895.[186]

The first North American copyright case concerning motion pictures was filed by Thomas Edison.[187] One of Edison's employees had made a movie about the launching of Kaiser Wilhelm's yatch, the *Meteor*. Lubin, a rival of Edison, copied and distributed this movie without Edison's permission. The trial court refused to grant copyright protection on the ground that motion pictures were not expressly covered by the *Copyright Act*. In 1903, the Court of Appeals reversed this ruling, stating that motion pictures stemmed from the technology used for photography. Therefore, the inclusion by the American Congress of photography in the *Copyright Act* encompassed motion pictures.

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[185] See *The Shift to Projectors and the Vitascope (1895-1896)* online: Library of Congress <http://learning.loc.gov/ammem/edhtml/edshift.html#T> (date accessed: 15 August 1999); Macgowan, *supra* note 132 at 78.

[186] See *Discovery*, *supra* note 179; Sterling, *supra* note 182 at 24; Macgowan, *ibid.* at 80.

[187] See *Edison* v. *Lubin*, 119 F. 993 (E.D. Pa. 1903), 122 F. 240 (3rd Cir. 1903). See also Goldstein, *supra* note 17 at 62.

Another interesting problem was the adaptation of a protected work for cinema.[188] Some movies had plots based on an already published novel or story. North American copyright had already recognized a copyright infringement in the translation or dramatization of a work without the permission of the copyright owner.[189] However, the *Act* and case law were silent regarding cinematographic adaptation.

In the same year that the Court of Appeals decided the *Edison* case, the American Supreme Court addressed the question in *Kalem* v. *Harper Bros.*[190] In this case, the Kalem company was producing motion pictures, and the company had employed a man to read Ben Hur and to write a screenplay adapting the novel for the cinema. Kalem, based on this adaptation, took negatives for moving pictures of the different scenes, from which it produced films suitable for exhibition. It advertised them under the title " Ben Hur: Scenery and Supers by Pain's Fireworks Company ". The film was sold and public exhibitions soon followed.

The Supreme Court first addressed whether the public exhibition of this moving picture infringed any rights under copyright law:

> By Rev. Stat. 4952, as amended by the Act of March 3, 1891, chap. 565, 26 Stat. at L. 1106, U. S. Comp. Stat. 1901, p. 3406, authors have the exclusive right to dramatize any of their works. So, if the exhibition was or was founded on a dramatizing of Ben Hur, this copyright was infringed. We are of opinion that Ben Hur was dramatized by what was done. Whether we consider the purpose of this clause of the statute, or the etymological history and present usages of language, drama may be achieved by action as well as by speech. Action can tell a story, display all the most vivid relations between men, and depict every kind of

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[188] Another difficulty in the application of copyright was to determine who was the author of the work. See generally D. Létourneau, *Le droit d'auteur de l'audiovisuel : une culture et un droit en evolution*, (Cowansville, Québec: Yvons Blais, 1995) at 21ff; Y. Laberge, "La notion d'auteur et le droit d'auteur au cinéma : aperçu historique, juridique et sociologique" (1997) 38 C. de D. 831; R.-M. Perry, "Copyright in Motion Pictures and Other Mechanical Contrivances", 5 C.P.R. (2d) 256 at 273ff.

[189] See *Stowe* v. *Thomas*, 23 Federal Cases 201 (C.C.E.D. Pa. 1853); Goldstein, *supra* note 17 at 57.

[190] See 222 U.S. 239 (1903) online: FindLaw <http://www.findlaw.com/casecode/supreme.html> (date accessed: 19 August 1999).

> human emotion, without the aid of a word. It would be impossible to deny the title of drama to pantomime as played by masters of the art. Daly v. Palmer, 6 Blatchf. 256, 264, Fed. Cas. No. 3,552. But if a pantomime of Ben Hur would be a dramatizing of Ben Hur, it would be none the less so that it was exhibited to the audience by reflection from a glass, and not by direct vision of the figures,-as sometimes has been done in order to produce ghostly or inexplicable effects. The essence of the matter in the case last supposed is not the mechanism employed, but that we see the event or story lived. The moving pictures are only less vivid than reflections from a mirror. With the former as with the latter our visual impression-what we see-is caused by the real pantomime of real men through the medium of natural forces, although the machinery is different and more complex.[191]

Thus, the infringers were the exhibitors of the film, not those who produced it. But in this case the defendant was the producer. Justice Holmes resolved this difficulty:

> But again, it is said that the defendant did not produce the representations, but merely sold the films to jobbers, and on that ground ought not to be held. In some cases where an ordinary article of commerce is sold nice questions may arise as to the point at which the seller becomes an accomplice in a subsequent illegal use by the buyer. It has been held that mere indifferent supposition or knowledge on the part of the seller that the buyer of spirituous liquor in contemplating such unlawful use is not enough to connect him with the possible unlawful consequences (Graves v. Johnson, 179 Mass. 53, 88 Am. St. Rep. 355, 60 N. E. 383), but that if the sale was made with a view to the illegal resale, the price could not be recovered (Graves v. Johnson, 156 Mass. 211, 15 L.R. A. 834, 32 Am. St. Rep. 446, 30 N. E. 818). But no such niceties are involved here. The defendant not only expected but invoked by advertisement the use of its films for dramatic reproduction of the story. That was the most conspicuous purpose for which they could be used, and the one for which especially they were made. If the defendant did not contribute to the infringement, it is impossible to do so except by taking part in the final act. It is liable on principles recognized in every part of the law.[192]

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[191] See *ibid.*
[192] *Ibid.*

Consequently, in 1903, the jurisprudence established copyright protection for works created by the motion picture technique and protected existing works against cinematographic dramatization. The American legislature seems to have agreed with this interpretation because it took almost a decade before it modified the *Copyright Act* to specifically include motion pictures under its protection.[193]

As with photography, motion picture development seems to have been positively affected by the inclusion of the device within the scope of copyright. The investments made in motion pictures were secured by its inclusion as a copyrighted work. The legal security to create a cinematographic production that could not be copied without the copyright owner's permission encouraged producers to invest more money in original production and led to higher quality movies. Also, the possibility of having exclusive distribution contracts permitted investors to increase revenues generated from motion pictures. Thus, those elements increased both investors' interest in motion pictures and motion picture production, leading to more diversity for consumers and to a higher popularity of the medium.

On the other hand, the duty to pay fees to authors raised production costs. The cinematographic adaptation of a popular novel without the copyright owner's permission was no longer possible. Because this right might be acquired on an exclusive basis, it increased the monetary value of the script. The higher production costs of motion pictures probably diminished the interest of some entrepreneurs in this industry.

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[193] See *Act of Aug. 24, 1912*, ch. 356, Pub. L. No. 62-303, 37 Stat. (part 1) 488-90. See also Goldstein, *supra* note 17 at 243. It was included in the Canadian Act in 1921. See *Copyright Act*, *supra* note 91, ss. 3(1)(e) & 2(d). See also Fox, *supra* note 12 at 171. For information about the statutory protection of cinematographic production in United States, see Sterling, *supra* note 182 at paras. 4.24ff, and for Canada, see Sterling at para. 4.19ff.

The inclusion of motion pictures within the scope of copyright might have compensated for the negative effect of preventing unauthorized cinematographic adaptations. Overall, copyright seems to have had a positive impact on the device's development. Today, motion pictures are one of the most popular types of entertainment in North America.[194] Hollywood producers invest millions in the production of movies and sell their exclusive reproduction rights to international distributors. The monopoly of the latter and huge marketing promotions have led many consumers to pay the high prices associated with seeing cinematographic productions.

3.5. Radio

It is difficult to examine the history of radio without first acknowledging the role that the telegraph played in its development. In 1838, K.A. Steinheil of Munich showed that one of the two wires used in overland telegraphy could be dispensed with by using an earth ground. He was hopeful that eventually the second wire would also be eliminated and "wireless" telegraphy would be possible. Twenty-five years later, Mahlon Loomis realized this dream by transmitting wireless telegraph messages between two mountains in Virginia. In 1872, he received a patent from the United States Government for a form of wireless communication.[195]

In 1898, Guglielmo Marconi installed the world's first commercial radio service on Rathlin Island, off the coast of Ireland, and a year later he equipped three British battleships with wireless radio.[196] The same year, Nathan B. Stubblefield used the medium to transmit voice messages. In 1900, Reginal Fessenden theorized that an alternator could generate an electromagnetic wave capable of

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[194] In 1995, revenues generated by the theatrical presentation were $239 million in Canada. *Profile of the film and video distribution and videocassette wholesaling industry* online: Statistics Canada <http://www.statcan.ca/english/Pgdb/People/Culture/arts15.htm> (date accessed: 3 November 1999).

[195] See B. Chris, "Pre-1900 - The Theory and Foundation" (1999) online: Surfing the Aether <http://www.northwinds.net/bchris/pre1900.htm> (last modified: 1 July 1999) [hereinafter "Pre-1900"].

[196] See G.L. Archer, *History of Broadcasting: Radio to Television: History of Radio to 1926* (New York: Arno Press, 1971) at 58; O.E. Dunlap, *The Story of Radio* (New York: Dial Press, 1927) at 18.

carrying voice and music. He used a spark generator to send the human voice a distance of about one mile.[197]

In 1904, inventor Ernst Alexanderson was assigned by the General Electric Company to build a high-frequency machine that would operate at high speed and produce a continuous-wave emission. After two years of experimentation, Alexanderson finally constructed a two-kilowatt, 100,000-cycle machine, which was installed at Fessenden's station in Brant Rock, Massachusetts.[198] For the first time, on Christmas Eve 1906, Fessenden's station broadcast speech and music to surprised ship operators.[199] The programming included a female voice singing a Christmas carol, a violin solo by Fessenden, and an invitation to report on the program's reception. Nine years later, human voices were broadcast across the Atlantic Ocean, between Arlington, Virginia and the Eiffel Tower in Paris.[200]

On 2 November 1920, Frank Conrad and Donald Little broadcast electoral returns from 8:00 p.m. until after midnight,[201] an event that greatly increased interest in radio technology. Different radio stations began to offer more diversified content, and it soon became possible to hear religious services and bedtime stories on the air. In 1921, speakers began to replace headphones, making radio programs accessible to more than one listener at a time. Accessibility was also spurred on by falling radio prices resulting from growing competition. By 1922, 537 stations were broadcasting programs, and 100,000 radio sets had been manufactured. The commercialization of the radio really

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[197] See "Pre-1900", *supra* note 195.

[198] See *Ernst F. W. Alexanderson* online: Inventure Place (National Inventors Hall of Fame) <http://www.invent.org/book/book-text/0.html> (date accessed: 20 August 1999); Archer, *supra* note 196 at 83.

[199] See Archer, *ibid.* at 84.

[200] See *ibid.* at 97; B. Chris, "1910-1919 - Technical Advances" (1999) online: Surfing the Aether <http://www.northwinds.net/bchris/1915.htm> (last modified: 1 July 1999).

[201] See B. Chris, "1920-1929 - Early Broadcasting" (1999) online: Surfing the Aether <http://www.northwinds.net/bchris/1920.htm> (last modified: 1 July 1999).

began when, on 28 August 1922, at 5:15 p.m., WEAF in New York first offered airtime to advertisers.[202]

In 1923, WEAF, WJAR, and WMAF linked by phone to produce the first network broadcast.[203] The same year, Edwin Armstrong invented the first "portable" radio as a wedding gift for his wife. In 1924, the AM band was assigned. By then, over 1400 stations were broadcasting and 3 million radio sets were in use in the United States alone. As radios became more complex, the radio repair industry developed.

In 1926, an American court decided that the Secretary of Commerce had the power to issue licenses but not to regulate broadcasting. At the same time, "Pay Radio" began in Philadelphia. Placed in retail stores, these big radios cost a nickel for 5 minutes of listening time.

In 1932, the first car radios were introduced.[204] The next year, several phonograph companies start labeling records "not licensed for radio broadcast" to protect their copyrights. In the early 1940's, jacks on the back of new radios allowed televisions to be plugged in. The FM band gained public interest as noise-free high fidelity broadcasting grew.[205]

In 1947, John Bardeen, Walter Brattain, and William Shokley invented the transistor, allowing radios to shrink in size. Over 800,000 FM receivers were produced. Miniature tubes, rectifiers, transformers, and printed circuit boards were now used in the production of receivers. In the 1950's, more than 90

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[202] See *ibid.*; Archer, *supra* note 196 at 275.
[203] See Archer, *ibid.* at 335.
[204] See B. Chris, "1930-1939 - The Golden Age" (1999) online: Surfing the Aether <http://www.northwinds.net/bchris/1930.htm> (last modified: 1 July 1999).
[205] See B. Chris, "1940-1949 - The War Years - Growth" (1999) online: Surfing the Aether <http://www.northwinds.net/bchris/1940.htm> (last modified: 1 July 1999).

million radio sets were in use in the United States. The marketing of radio transistors also began.[206]

American copyright had already recognized a copyright on public performances for profit.[207] This right generated royalties, in the form of licensing fees, that were received by the American Society of Composers, Authors, and Publishers (ASCAP).[208]

The introduction of radio interested ASCAP because of its potential market for licensing.[209] Radio stations were broadcasting composers' music without paying fees. Listeners were able to enjoy new music without paying for records or access to performances. The new medium was creating a precedent in sharing freely with a large public copyrighted works.

ASCAP engaged in a battle with radio stations.[210] The first step was for the court to legally recognize that public performances included broadcasting since it was for the public and for profit. Thus, ASCAP would be in a position to receive royalties from radio stations.

To make its point, ASCAP sued Bamberger, a department store that operated and sponsored programs on a New Jersey radio station.[211] Relying extensively on the *Herbert* v. *Shanley* Supreme Court decision, the District Court ruled that:

> Adopting the language of Justice Holmes [*Herbert* decision], the defendant is not an "eleemosynary institution." A department store is conducted for profit, which leads us to the very significant fact that the cost of the broadcasting was charged against the

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[206] See B. Chris, "1950-1959 - Coming of Age" (1999) online: Surfing the Aether <http://www.northwinds.net/bchris/1950.htm> (last modified: 1 July 1999).
[207] See *Herbert* v. *Shanley*, 242 U.S. 591 (1917).
[208] See Goldstein, *supra* note 17 at 72. For more information on the role of copyright collectives, see P. Spurgeon, "Digital Networks and Copyright: Licensing and Accounting for Use-The Role of Copyright Collectives Evolution or Revolution?" (1998) 12 I.P.J. 225.
[209] See *ibid.*
[210] To defend their interests, radio stations formed the National Association of Broadcasters. See *ibid.*
[211] See *Witmark* v. *Bamberger*, 291 F. 776 (D.N.J. 1923).

> general expenses of the business. It was made a part of the business system.
>
> Next we have the fact, already referred to that the defendant sells radio receiving instruments and accessories. Whether a profit has resulted from such sales is not material in determining the object. It is within the realms of probability that many departments of a large store at time show losses rather than profits. Paraphrasing the comments of Justice Holmes, "Whether it pays or not the purpose is profit and that is enough." While the defendant does not broadcast the sale prices of its wares, or refer specifically thereto, it does broadcast a slogan which appears in all of the defendant's printed advertisement.[212]

Judge Lynch concluded that radio broadcasting by the department store was a public performance for profit. Responding to the defendant's argument, he added:

> The defendant argues that the plaintiff should not complain of the broadcasting of its song because of the great advertising service thereby accorded the copyrighted number. Our own opinion of the possibilities of advertising by radio leads us to the belief that the broadcasting of a newly copyrighted musical composition would greatly enhance the sales of the printed sheet. But the copyright owners and the music publishers themselves are perhaps the best judges of the method of popularizing musical selections. There may be various method of bringing them to the attention of music lovers. It may be that one type of song is treated differently than a song of another type. But, be that as it may, the method, we think, is the privilege of the owner. He has the exclusive right to publish and vend, as well as to perform.

Thus, American copyright chose to include radio in the definition of public performance, an already unauthorized type of reproduction.[213] It was an easy way to make the new medium fall within the scope of copyright. The decision was not brought to appeal and, following this victory, ASCAP forced broadcasting stations to pay for a license.

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[212] See *Hebert*, *supra* note 207.

[213] For a Canadian perspective, see Fox, *supra* note 12 at 400ff.

At the beginning, the fees were relatively low, and the stations agreed to the licensing. But, as radio became more successful, ASCAP used its monopoly to increase the price of the licenses, arguing that music filled the majority of the broadcasting time and that broadcasting musical works decreased sales of records and sheet music. The broadcasters disagreed, arguing again that the free advertising they were giving increased sales of sheet music and records. The discontent of broadcasters was escalating. ASCAP's licenses were set to expire on 31 December 1940, and the radio stations were expecting an excessive fee augmentation. Thus, the broadcasters decided to compete with ASCAP by creating their own licensing system.

In September 1939, the radio stations announced the creation of Broadcast Music, Inc. (BMI), a corporation owned exclusively by broadcasters. The new entity had to create a catalogue of works it could license, a difficult task since the majority of artists were already included in ASCAP's repertory. However, the broadcasters persevered and concentrated theirs efforts on Latin American music and new composers.

From the beginning of 1940, radio stations, except for some of the smaller ones, only broadcast Latin music or music in the public domain, like old classical music. Advertisers stood by the broadcasters in this battle against ASCAP's monopoly. In autumn 1941, ASCAP capitulated and agreed to new licenses with more reasonable prices.[214] In fact, ASCAP members had seen the impact of radio on sales of their disks and sheet music. They were now eager to be broadcast to the public.[215]

The inability to broadcast "hits" certainly diminished the popularity of the radio. Popular music, which appealed to young adults and teenagers, was a large part

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[214] See Goldstein, *supra* note 17 at 74.

[215] For a 1940 vision of the radio legal phenomenon, see A. Du Pasquier, *Le droit du fabricant sur les disques de gramophone* (Paris: Recueil Sirey, 1940) at 15ff.

of radio programming. When such music was no longer available, the younger generation lost some of its enthusiasm for radio. However, this situation only existed for a short period of time, from spring 1940 to autumn 1941, and did not prevent the invention of the radio transistor in 1947. As illustrated by the history of radio, in the 1950's radio's popularity was still growing, and an average of two radios for every home was counted in the United States.[216]

Consequently, copyright scarcely affected radio's popularity. The right by itself did not have any influence; it was included within the scope of copyright in 1927 without affecting radio's evolution. The real delaying factor was ASCAP's utilization of the right, which created a minor setback in radio's popularity. After this incident, radio went on to become one of the most popular mediums of modern time.[217]

3.6. Cable Television System

In the 1940's, the television broadcasting industry was in its infancy. For the most part, television (TV) stations were serving urban areas with relatively low powered transmitters, and viewers could receive satisfactory pictures with rabbit ears. Away from urban centers, the signals weakened considerably, and viewers needed larger rooftop antennas mounted at heights of 30 to 100 feet above the mean terrain to receive good reception.[218]

Pennsylvania is generally considered as the first region in North America to offer cable TV. In the late 1940's, citizens of a small town situated in a valley just outside a large city wanted to have access to television technology. The closest city had a new television station but due to the valley, its signals did not reach

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[216] See Goldstein, *supra* note 17 at 74.

[217] In 1998, the revenues made by the radio stations only in Canada were of 942 millions $. See *Private radio* online: Statistics Canada <http://www.statcan.ca/english/Pgdb/People/Culture/arts09.htm> (date accessed: 3 November 1999).

[218] See C. Tate, *Cable Television in the Cities: Community Control, Public Access, and Minority Ownership* (Washington, DC: Urban Institute, 1972) at 11; *History of Cable Television* online: Mountain

the town. Tired of the situation, a decision was made to build a tower on the mountain to receive the signals and transport them down the mountainside to the homes below. The citizens were rewarded with exceptional reception of the broadcast for their new television sets.[219]

As the number of television receivers increased rapidly and television broadcasters augmented the quality and quantity of their programming, the desire for television services intensified in the urban areas. In Oregon, in 1948, Ed Parsons installed some antennas and an amplifier to boost the weak signals he received. He ran a transmission cable into town and connected a few of his friends and neighbors to the system, bringing them TV signals not normally available in that area. After much trial and error, Parson's improved his system's reliability and expanded his service area. Soon other cities and towns followed Parson's example, and the number of cable systems grew rapidly.[220]

In Ontario, Canada, cable[221] was introduced in the early 1950's.[222] Canadians were interested in receiving television programs, but no television stations were broadcasting in Canada. Still, television sets were beginning to appear in some Canadian homes. In order to receive American signals from Cleveland, high powered antennas were developed to pick up the distant stations' broadcasts. The cable system permitted Canadians to join the television era.[223]

Cablevision <http://www.mountain.wave.ca/history.htm> (date accessed: 22 August 1999) [hereinafter *History Cable*].

[219] See *ibid.*

[220] For further information about the cable system, see R. Gillard, *L'antenne collective et la communication par fil au public en droit de propriété intellectuelle* (Berne: Herbert Lang, 1976) at 13ff; F. Lalonde, *La câblodistribution et le droit d'auteur : Éléments de reflexion* (Quebec, Ministère des communications, 1983) at 1.

[221] Also named Cable Antenna Television (CATV). See C. Wilkerson "Long Awaited Solution To The Cable-Copyright Dilemma: The Copyright Act Of 1976" (1978) 26 Chitty's L.J. 127.

[222] See *History Cable*, *supra* note 218.

[223] See V. Nabhan " La télévision par câble et le droit d'auteur au Canada " (1981) R.C.D.A. 8 at 8-9.

The first North American decision dealing with a cable system was the *Canadian Admiral* case,[224] in 1954. Canadian Admiral Corporation sponsored live broadcasts of Montreal Football Club games. In consideration of this sponsorship, the company had the exclusive right to telecast football games live and all the copyrights linked to this broadcasting. Rediffusion, Inc. transmitted by wire the same games to its various subscribers and to its showroom. Canadian Admiral sued Rediffusion, Inc. for copyright infringement.

The Court decided that copyright existed only for a fixed work. As the football games were broadcast live, there was no fixation of the work. Therefore, Canadian Admiral had no expectation of copyright. The Court also analyzed the relation between the cable transmission and the legal concept of public performances. Redifussion, Inc. argued that it was not performing the work, only transmitting it, thereby enlarging the audience. After examining the jurisprudence, the Court refuted the argument, stating:

> I have no hesitation, therefore, in reaching the conclusion that the rediffusion of the film telecasts in question by the defendant in the manner which I have described constituted a "performance" of the plaintiff's work.
>
> That, however, does not conclude the matter ; mere performance is not enough ; in order to find that the defendant infringed the plaintiff's right, I must find that the public performance was "in public". The Act does not define "in public" and it would be undesirable for me to attempt to do so except to state that I

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[224] See *Canadian Admiral, supra* note 112. See also Y. Gendreau, *The Retransmission Right: Copyright and the Rediffusion of Works by Cable* (Oxford : ESC, 1990) at 5; W. Filipiuk, "The Canadian Admiral Case: Canada's Law of Unfair Competion" (1958) 29 C.P.R. 31; D. Morgan, "Cable, Computers, Copyright and Canadian Culture" (1986) 2 I.P.J. 69 at 76; N. Tamaro, "La bonne lecture d'un mauvais arrêt et la mauvaise lecture d'un bon arrêt ou pourquoi les auteurs ont été indûment privés de millions de dollars en redevances pour la câblodistribution de leurs oeuvres?" (1991) 4 C.P.I. 71. *Statement of Royalties to Be Collected for the Performance or the Communication by Telecommunication, in Canada, of Musical or Dramatico-Musical Works* (27 October 1999), Tariff 22 (C.B.D.)[hereinafter *Tariff 22*].The first American decision dealing with copyright appeared only in 1968. See *Fortnightly* v. *United Artists Television*, 392 U.S. 390 (1968) online: FindLaw <http://www.findlaw.com/casecode/supreme.html> (date accessed: 22 August 1999) [hereinafter *Fortnightly*]. See Goldstein, *supra* note 17 at 89.

> regard it as the antithesis of "in private". Each case must depend on its own particular facts.[225]

The judge examined other cases and after some analysis concluded that none of them suggested that a performance in a private home where the performance is given, heard, or seen only by members of that household could be considered as a public performance:

> As to the character of the audience in homes and apartments to which the telecast of the live films were "rediffused" by the defendant, there is no evidence whatever except that they were seen by the defendant's subscribers, presumably only the householders. The character of the audience was therefore a purely domestic one and the performance in each case was not a performance in public. Counsel for the plaintiff, however, submits that even if one such "view" in the privacy of the owner's home does not constitute a performance in public. He says that from the point of view of the owner, a large number of such performances would constitute an interference with the owner's right of making copies of his work and might cause him to lose part of his potential market. I am unable to agree with that submission. I cannot see that even a large number of private performances, solely because of their numbers, can become public performances. The character of the individual audiences remains exactly the same; each is private and domestic, and therefore not "in public". Moreover, in telecasting the films, I think the plaintiff desired to have the telecast seen by as many people as were within range and possessed the necessary receiving equipment in order that they might be informed of its product; so that I do not think that what was done by the defendant in so far as the private homes and apartments are concerned, interfered with his potential market in any way. It was stated and not denied that the films, including the commercial announcements of the plaintiff were rediffused as a whole.[226]

Therefore, the Court concluded that the performance in the homes and apartments of the subscribers of the defendant company were not public performances.[227]

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[225] *Canadian Admiral, supra* note 112 at 97.

[226] *Ibid.* at 101-102

[227] This approach was used by the US Supreme Court. See *Fortnightly, supra* note 224; *Teleprompter.* v. *CBS*, 415 U.S. 390 (1968); P. Maxwell, "Cable and Copyright: The Victor Belongs to the Spoils" 12

For many years following this decision, North American copyright did not protect authors against the cable transmission of their works. Provisions concerning transmission rights were finally included in the American *Copyright Act of 1976*[228] and in the Canadian *Copyright Act* in 1988 when the *Canada-United States Free Trade Agreement Implementation Act* was adopted.[229]

Because the new invention was not primary included within the scope of copyright, North American copyright does not seem to have had a negative influence on cable development. When the legislatures finally decided to protect authors against this type of transmission, the technology was already fully developed and established, and consumers were aware of the technology and had access to it.

The inflation of prices that probably followed the technology's inclusion in the copyright scope had no impact on the already well established industry. Cable technology had already reached the commercial market, and the consumer had come to depend on it. Nowadays, cable is still widely used by North Americans.[230] Consequently, it appears that North American copyright did not delay cable development.

C.P.R. (2d) 259 at 261; B. Waite, "Electronic Mass Media and Copyright in Canada and the U.S." (1989) 1 J.P.T.O.S. 269 at 292; Wilkerson, *supra* note 221 at 128; S.C. Green, "The Cable Television Provisions of the Revised Copyright Act" in G.P. Bush & R.H. Dreyfuss, eds., *Technology and Copyright* (Mt. Airy, Maryland: Lomond Books, 1979) at 275.

[228] See *Copyright Act of 1976*, Pub. L. 94-553.

[229] See SC 1988, c. 65. See also Gendreau, *supra* note 224 at 1; Y. Gendreau "A Canadian Retransmission Right: A Reality at Last" (1989) 4 I.P.J. 397 at 408. For a governmental perspective on the issue, see generally F. Lalonde, *La câblodistribution et le droit d'auteur : Éléments de réflexion* (Québec, Ministère des communications, 1983) at 1; *From Gutenberg to Telidon: A White Paper on Copyright* (Ottawa: Consumer and Corporate Affairs Canada, 1984). For an American perspective, see *ibid.*; J.K. Miller, *Video Copyright Permissions: A Guide to Securing Permission to Retain, Perform, and Transmit Television Programs Videotaped Off the Air* (Friday Harbor: Copyright Information Services, 1989).

[230] In 1997, 10.4 million houses were served by cable in Canada. See *Cable Television Industry* online: Statistics Canada <http://www.statcan.ca/english/Pgdb/People/Culture/arts11.htm> (date accessed: 3 November 1999).

3.7. Photocopier

The photocopier, based on dry copying, was the next technology to challenge copyright:

> DRY COPYING exploits the principles that materials with opposite electrical charges attract one another and that some materials conduct electricity better after exposure to light. In the basic xerography process, a photoconductive surface receives a positive electrical charge (*a*). An image is then exposed on the surface; because the illuminated sections (the nonimage areas) become more conductive, their charge dissipates (*b*). Negatively charged powder spread over the surface adheres through electrostatic attraction to the positively charged image area (*c*). A piece of paper is then given a positive charge (*d*) and placed over the surface, where it attracts the negatively charged powder (*e*). Finally, heat fuses the image as etched in powder to the paper (*f*).[231]

Chester F. Carlson, who earned his Bachelor of Science degree in Physics at the California Institute of Technology, invented the technology. Carlson started his career in 1930 at the electronics firm P.R. Mallory Company, where he worked for the patent department.[232] As a patent analyzer, he was required to prepare paperwork submitted to the patent office when registering inventions and ideas.[233] Because the patent office required multiple copies of all documents, he had to copy them either by sending the patents out to be photographed or by writing additional copies by hand. Both methods were very expensive and time consuming.

Using his scientific background, Carlson tried to solve this problem, and so he turned his attention to photoconductivity, a relatively new process discovered by

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[231] C. Holt, "Photocopiers" online: Xerox Corporation, <http://www.sciam.com/1096issue/1096working.html> (date accessed: 1 September 1999).

[232] See *Chester F. Carlson* online: Inventure Place (National Inventors Hall of Fame), <http://www.invent.org/book/book-text/20.html> (date accessed: 1 September 1999); S. Silverman, "Xerography: the Invention that No One Ever Wanted" online: Useless Information, <http://home.nycap.rr.com/useless/xerox/xerox.html> (date accessed: 2 September 1999).

[233] See *Chester F. Carlson (1906-1968): The Photocopier* online: The Lemelson-MIT Awards Program's Invention Dimension <http://web.mit.edu/invent/www/inventorsA-H/carlson.html> (date accessed: 2 September 1999).

Hungarian physicist Paul Selenyi. It seems that when light strikes the surface of certain materials, its conductivity increases. Carlson anticipated that if the image of an original photograph or document was projected onto a photoconductive surface, "current would only flow in the areas that light hit upon (and not in the areas of darkness - the print)".[234]

Carlson's first lab was set up in the kitchen of his apartment in Jackson Heights, Queens in New York City. He applied for his first patent in October 1937.[235] Later, his laboratory was moved to a room in the back of a beauty salon in Astoria, Queens, and he hired an unemployed German physicist named Otto Kornei to help him. It is in this laboratory that the first photocopy was made:

> So, one day Otto took a zinc plate and covered it with a coating of freshly prepared batch of sulfur. He then wrote the words "10-22-38 Astoria" on to a microscope slide in India ink. The room was darkened. The sulfur was rubbed with a handkerchief to give it a charge. The slide was then placed on top of the sulfur and placed under a bright light for a few seconds. The slide was then removed and the sulfur surface was covered with lycopodium powder (the waxy spores from clubmoss).
>
> With one giant breath of air, the lycopodium was blown off of the sulfur surface. And there it was - an almost exact mirror image that said - you guessed it - "10-22-38 Astoria".
>
> The real trick was in preserving the image. Carlson took wax paper and heated it over the remaining powder. The wax cooled around the spores and was then peeled away. [236]

The process was not yet complete, but at least Carlson's theory was confirmed. Because continuing the research required more money, Carlson began looking for investors. Surprisingly, the new technology did not interest anyone. Between 1939 and 1944, Carlson was turned down by more than twenty large corporations, including IBM, Kodak, General Electric, RCA, and the like.[237]

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[234] *Ibid.*; Silverman, *supra* note 232.
[235] See *ibid.*
[236] *Ibid.*
[237] See *ibid.*

Finally, in 1944, he found a partner. The Battelle Memorial Institute, a nonprofit research organization, concluded a royalty-sharing arrangement with Carlson.[238] Battelle assigned the project to Roland M. Schaffert, a research physicist and a former printer. Because it was during the Second World War, American researchers and money were occupied with defense efforts. Therefore, Schaffert was the only person working on this project for almost a year. At the end of the war, Battelle provided Schaffert with a small group of assistants to improve the process.[239]

Schaffert's team made several improvements to photocopy technology. First, they developed a new photoconductive plate to replace the sulfur plate that Carlson had used. The new plate was covered with Selenium, a much better photoconductor. They also created a corona wire, which applied the electrostatic charge to the plate and transferred powder from the plate to the paper.

The most important improvement made by the team was the use of dry ink:

> Carlson's use of lycopodium powder and other materials produced a somewhat blurry image. Battelle researchers substituted a fine iron powder for dry ink and mixed in ammonium chloride salt and a plastic material. The ammonium chloride is included to clean up the image (it has the same charge as the metal plate, so in the areas where there is low charge (areas of no image), the iron particles stick to the salt and not to the plate. The plastic material is designed to melt when heated and fuses the iron particles to the paper. They called this material *toner*, since one can very simply use different tones of developer to produce any color desired (three superimposed colors could be used to produce full color copies).[240]

In 1947, Battelle signed a licensing agreement with a small company known as Haloid. At the time, Haloid was manufacturing photographic products and was

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[238] See Silverman, *ibid.*; Holt, *supra* note 231.
[239] See Silverman, *ibid.*
[240] *Ibid.*

looking for a new technology to develop. In 1948, the new partners publicly demonstrated the electro-photography device, and that same year, they also marketed the first photocopiers.[241] This new product was not a commercial success. The whole process was inefficient and was not practical when making many copies. Fourteen different steps had to be completed by the user, and each copy took at least 45 seconds to be produced.

To improve the product, Haloid replaced the flat plate system with a simpler one with rotating drums. The company also came up with a better name for the process. Because *electro-photography* was not a very catchy name, it was changed to *xerography*, which stems from the Greek words *xeros* for "dry" and *graphos* for "writing".[242] Haloid named the first generation of this photocopier the *XeroX Model A*.

The first commercially successful, fully automated photocopier was produced in 1959. It was named "Model 914" because it could handle paper up to 9" x 14" in size. By the end of 1961, Haloid, now named Xerox,[243] had nearly $60 million in revenue.

This new technology was particularly useful to libraries wishing to copy articles from specialized journals. For example, the United States government's National Library of Medicine was photocopying tens of thousands of articles from specialized medical journals each year without payment and permission.[244] For Williams Passano, president of Williams & Wilkins, one of the more important medical journal editors, it was unacceptable. He decided to make it his personal

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[241] See *ibid.*

[242] In 1958, Haloid changed its name to Haloid Xerox, and then in 1961 to Xerox. See *ibid.*; *Online Factbook: Historical Highlights* online: Xeros Corporation <http://www.xerox.com> (date accessed: 2 September 1999).

[243] See *ibid.*

[244] See Goldstein, *supra* note 17 at 79.

mission to stop such photocopying, and he commenced a lawsuit against the National Library.[245]

As we have seen, copyright law has been regularly extended to include new technologies. However, the photocopier introduced a new problem. In contrast to the radio, printing press, or piano roll, it was almost impossible to control the source of the copy as photocopies were being made in offices and libraries around the world,[246] and therefore, it was almost impossible to license or control the copy making. Furthermore, the royalty per copy was low and thus it was difficult to justify invading the privacy of everyone who might make copies.[247]

In 1968, Williams & Wilkins initiated a lawsuit against the National Library of Medicine and the National Institute of Health.[248] Because the government was involved, the action was brought forward in the Court of Claims. James F. Davis was the commissioner assigned to the case. The lawyer of Williams & Wilkins, Alan Latman, divided the lawsuit into two. In the first part, he attempted to demonstrate the copyright infringement, while in the second part he tried to demonstrate the damage. This strategy was adopted to avoid having to prove the second part. The government, facing copyright liability, would probably settle for having a license to copy all the Williams & Wilkins' publications.

The debate centered around the fair use issue. Since most of the copies were made one at the time, the question was: Can the photocopying of a single article be defined as copyright infringement? In 1935, before the invention of the

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[245] See *ibid.*

[246] See R.C. Sharp, "Licensing the Photocopier" (1980) 62 C.P.R. 196 at 196; V. Nabhan " Les nouveaux moyens de reproduction, papiers, sonores, audiovisuels " (1986) 46 R. du B. 739 at 752; King Research, Inc., "Summary of Library Photocopying in the United States" in G.P. Bush & R.H. Dreyfuss, eds., *Technology and Copyright* (Mt. Airy, Maryland: Lomond Books, 1979) 355; M. Line & D. Wood, "The Effect of a Large-Scale Photocopying Service on Journal Sales" in G.P. Bush & R.H. Dreyfuss, eds., *Technology and Copyright* (Mt. Airy, Maryland: Lomond Books, 1979) 375; E. Van Tongeren, "The Effect of a Large-Scale Photocopying Service on Journal Sales" in G.P. Bush & R.H. Dreyfuss, eds., *Technology and Copyright* (Mt. Airy, Maryland: Lomond Books, 1979) 387.

[247] See Goldstein, *supra* note 17 at 81.

[248] See *ibid.* at 82.

photocopier, libraries and publishing companies had concluded the *Gentlemen's Agreement* about the right to make copies. This agreement stated that:

> so long as a library made no profit from the practice, it could make a single photographic reproduction of copyrighted material for a scholar who stated in writing that he wanted it in lieu of loan of such publication or in place of manual transcription and solely for the purpose of research.[249]

Photographing documents was expensive and time consuming, and so publishers had signed the Agreement. But, with photocopying, the reality had changed.

Because the fair use doctrine is based on custom, this Agreement was a real problem for Williams & Wilkins. In addition to the *Gentlemen's Agreement*, the Public Health Service had included in its policy an express provision stating that, beginning on 1 July 1965, the government had a non-exclusive royalty-free license to copy or use publications in other ways as a result of a Public Health Service Grant.[250] This provision affected the majority of articles published in Williams & Wilkins' journals.

In 1972, Commissioner James Davis decided in favor of the publisher[251] and refuted the fair use theory:

> The photocopies are exact duplicates of the original articles ; and serve to diminish plaintiff's potential market for the original articles since the photocopies are made at the request of, and for the benefit of, the very persons who constitutes plaintiff's market.[252]

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[249] *Ibid.* at 85.
[250] See *ibid.* at 90.
[251] See *Williams and Wilkins* v. *The United States*, 172 U.S.P.Q. 670 (1972); W.L. Hayhurst, "Copyright and the Copying Machine" (1984) 9 Can. Bus. L.J. 129 at 135ff; S. Freid "Fair Use and The New Act" in G.P. Bush & R.H. Dreyfuss, eds., *Technology and Copyright* (Mt. Airy, Maryland: Lomond Books, 1979) 465.
[252] *Williams and Wilkins*, *ibid.* at 679.

This decision, sixty-three pages in length, examined all the aspects of the case. It was, however, appealed.

Denying the Davis decision, libraries refused to pay royalty fees.[253] Instead, they decided not to renew theirs subscriptions to Williams & Wilkins' journals. Since the National Library of Medicine's decision not to renew it subscription meant not being indexed in the *Index Medicus*, the publisher had to agree to the libraries' demands. In October 1972, it sent a letter to the libraries stating that it was withdrawing its claim to royalty fees.[254]

In 1973, Judge Oscar Davis of the Court of Claim expressed the court's decision.[255] He reversed Commissioner Davis' decision, affirming:

> First, plaintiff has not in our view shown, and there is inadequate reason to believe, that it is being or will be harmed substantially by these specific practices of NIH and NLM; second, we are convinced that medicine and medical research will be injured by holding these particular practices to be a infringement; third, since the problem of accommodating the interests of science with those of the publishers (and authors) calls fundamentally for legislative solution or guidance, which was not yet been given, we should not, during the period before congressional action is forthcoming, place such a risk of harm upon science and medicine.[256]

Afraid of the impact of this decision on photocopying practice, other publishers decided to join Williams & Wilkins in its efforts. They created a fund and presented an appeal to the U.S. Supreme Court. In May 1974, the U.S. Supreme Court agreed to hear the appeal in *Williams and Wilkins* v. *The United States*.

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[253] For a better understanding of the librarians' position, see L. Douglas, "Librarians, Copyright, and Technology: The Growth of Activism in the Quiet Profession" (1991) 6 I.P.J. 377.
[254] See Goldstein, *supra* note 17 at 109.
[255] See *Williams and Wilkins* v. *The United States*, 487 F.2d 1345 (1974).
[256] *Ibid.* at 348.

In 1975, after having hearing arguments for both sides, the highly anticipated Supreme Court decision was made public. It was a one-line decision: "The judgment is affirmed by an equally divided Court."[257] This simple line was the end of a seven-year saga.

Following this decision, on 19 October 1976, the American legislature passed a bill modifying the *Copyright Act*. [258] This modification included in the law a specific exception to copyright infringement for photocopies. It determined the conditions of this exception, such as the number of copies permitted. [259]

Photocopiers became a commercial success in 1959. However, the first definitive reaction by a legal body to the technology took place sixteen years later, in 1975, with the American Supreme Court's decision. In those years, even though some uncertainties about the legal use of the device existed, the general public and libraries continued to use the photocopier. This interest in the device permitted the technology to be widely distributed, and the commercial success it encountered permitted Xerox to improve its machines.[260]

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[257] See *Williams and Wilkins* v. *The United States*, 420 U.S. 376 at 376 (1975). B. Fry, H. White & E. Johnson, "Scholarly and Research Journals: Survey of Publisher Practices and Present Attitudes on Authorized Journal Article Copying and Licensing" in G.P. Bush & R.H. Dreyfuss, eds., *Technology and Copyright* (Mt. Airy, Maryland: Lomond Books, 1979) 355.

[258] *Supra* note 228 at title I, §101, 19 October 1976; Darling, *ibid.* at 110; Goldstein, *supra* note 17 at 143. For different suggestions on how to deal with photocopy technology, see Sharp *supra* note 246 at 200ff; S. Breyer, "The Uneasy Case for Copyright: A Study of Copyright in Books, Photocopies, and Computers Programs" (1970) 84 Harv. L. Rev. 281 at 329; L.B. Heilprin, *Copyright and Photocopying Papers on Problems and Solutions, Design for a Clearinghouse, and a Bibliography* (Baltimore: College and Library and Information Services University of Maryland, 1977).

[259] No particular disposition was made in Canada concerning the use of photocopiers as long as it was within the limits of "fair use". For a Canadian perspective on the photocopier problem, see V. Nabhan, "Les nouveaux moyens de repruduction, papiers, sonores, audiovisuels " (1986) 46 R. du B. 739 at 752ff; V. Nabhan "La photocopie et le droit d'auteur au Canada " (1978) 19 C. de D. 881; M. Paré "La reproduction de pages ou de parties de journaux ou autres périodiques et la loi du droit d'auteur du Canada" (1983) 4 R.C.D.A. 7; D. M. Cameron & S. H. Dimock, "Copyright and Copying Machines" (1987) 4 Can Comp. L. Rep. 186; S. Martin "La copie privée" (1989) 2 C.P.I. 27; D. Darling, "Reprography Collectives in Canada: The Impact on Educational Use" (1992) 9 C.I.P.R. 104.

[260] See *Xerox Research and Technology* online: Xerox <http://www.xerox.com/go/xrx/xrx_research/AX_6.jsp> (date accessed: 3 November 1999) [hereinafter *Xerox*].

Since it was almost impossible to control the source of the copy and because the royalty per copy was low and difficult to justify with the breach of privacy that would result, the Supreme Court chose not to interfere with photocopy technology.[261] The American legislature followed this position even though it regulated this new copyright exception.

In the 1990's, photocopiers continue to be useful to students, scholars, and professionals. The device has been constantly developed to be faster and easier to use.[262] With history behind us, it is possible to affirm that copyright did not delay the technological development of the photocopier.

3.8. Video Tape Recorder

The first known patent for the use of magnetic recording to store pictures was granted in the late 1920's, by the British patent office, to Boris Ritcheouluff of London. This picture recorder was based on a machine developed in Denmark many years earlier.[263] Around the same time, German engineer Eduard Schueller, working in Hamburg for Telefunken, filed for a patent covering a two-headed helical recorder.[264] Neither technique fulfilled its potential, and the evolution of magnetic picture recording only happened thirty years later.

In 1950, the newly established electronic division of Crosby Enterprises was trying to develop a magnetic TV recorder. They produced some prototype recorders that used fixed heads and high tape speeds.[265] Meanwhile, RCA's engineers were working on a similar project. Their efforts resulted in a longitudinal, high speed videotape recorder (VTR) that duplicated monochrome and color pictures. It was presented publicly in 1953. RCA felt confident enough

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[261] Goldstein, *supra* note 17 at 81 and *supra* note 246 and accompanying text.
[262] See *Xerox*, *supra* note 260.
[263] *Tape Recording Technology*, online: Broadcasting Engineering Magazine <http://www.technicalpress.com/Articles/History/History_recording.htm> (date accessed: 3 September 1999) [hereinafter *Tape Recording Technology*].
[264] See *ibid.*
[265] See *ibid.*

with this advanced color machine to make some program demonstrations at NBC in late 1955. It was even used for about two minutes on the air.[266]

The BBC also saw the potential advantages of a visual magnetic recorder. The research, begun in 1952, led to the creation of the Vision Electronic Recording Apparatus (VERA).[267] This apparatus was quite different from its contemporaries, and many of the developments achieved in this recorder served as departure points for the subsequent helical videotapes that were developed.

However, the commercial beginnings of video recording technology occurred on 14 April 1956 when Ampex demonstrated its videotape recorder. At the National Association of Radio and Television Broadcasters (NAB) Convention in Chicago, Ampex presented the first practical quadraplex VTR:[268]

> Lodge made his prepared presentation with what seemed like a pregnant pause at the end. Suddenly, the monitors in the room were showing what must have seemed to the audience as an impossibility, for they were looking at an instant playback of the Lodge speech, with an image clarity indistinguishable from the original they had seen a few minutes earlier. There was a hushed silence as those in the room tried to relate this assault on their senses, with their prior knowledge that TV images could not be immediately repeated by any known device. Cheers and applause then broke out.
>
> There was no available monitor for the Ampex team behind the curtain to check the playback before punching it up on the TV screens in the other part of the room. As a result, they had to operate on the blind faith that everything was working well. That short silence at the beginning of the playback seemed like an eternity to Ginsburg, Dolby, Anderson and Pfost.
>
> The station executives crowded in around the VTR, trapping the operating personnel against the machine, while they pushed,

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[266] See *ibid.*

[267] See *ibid.*

[268] *Recording Studio Technology History*, online: Trackrecord Studio <http://www.trackrecordstudio.com/recording.htm> (date accessed: 3 September 1999) [hereinafter *Recording Studio Technology*].

> elbowed and stood on chairs to get a glimpse of this latest video marvel. The VTR crew, who just a few minutes earlier were holding their breath in the fond hope that his hastily assembled contraption would perform on cue, were now busily answering questions from excited interrogators who were naturally curious about performance, price and availability.[269]

The historic first broadcast via videotape was the CBS airing of the *Douglas Edward and the News* program on 30 November 1956 from New York. CBS Television City in Hollywood replayed the broadcast three hours after it was received on the West Coast. However, confidence at CBS in the new machines was not all that high, and for a month the network ran a backup kinescope in case of a breakdown.

By 1957 many stations had received their first video recorders, but it took a while for the device to overtake the kinescope because stations did not completely trust the new technology, and most engineers were unfamiliar with its complicated circuits. Early video recorders suffered from a number of problems. "Skewing, scalloping, venetian blind effect and incorrect quadrature" became common terms among the new breed of video engineers.[270] As the industry became aware of the problems, solutions were developed, one at a time.

During the 1958 NAB Conference, Ampex unveiled a modified VR-1000 that produced color pictures.[271] RCA followed later that year with a modified videotape recorder that permitted color recording. Neither recorder, however, provided very good color reproduction. However, in 1958, CBS aired the first totally VTR-produced program, *Playhouse 90*.[272]

In 1963, Sony identified a new opportunity in the home consumer market and introduced the first home videotape. Six years later, the company introduced the

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[269] *Tape Recording Technology*, *supra* note 263.
[270] *Ibid.*
[271] See *ibid.*

first videocassette, the "¾-inch U-Matic one-hour tape".[273] For the first time, Sony allowed other manufacturers to sell machines that could play the cassette, and thus succeeded in establishing a world standard for the ¾-inch videocassette.[274] By 1972, the videocassette formats were sold by RCA, Sony, Ampex, and Avco, which all sought to develop a new consumer market for home video cassettes recorders (VCR).[275]

Still leading the home videotape market, Sony introduced, in 1975, the Betamax consumer VCR console only for $2295 and a one-hour ½-inch tape cassette for $15.95.[276] The company attempted to create a standardized format by getting seven other companies to agree to produce machines that would play Beta cassettes.[277]

The following year, JVC introduced in Japan the VHS format videotape for $885.[278] In response to this new product, Sony introduced a Betamax deck for $1300 and began aggressive advertising, claiming that it could "actually videotape something off one channel while you're watching another channel" and that you could "build a library of your favorite shows".[279]

In 1977, RCA announced it would sell VHS video recorders with 4-hour tapes.[280] Two years later, Sony introduced Betascan in April, which allowed a visible picture while fast-forwarding;[281] in 1983, it manufactured the Beta Hi-Fi VCR with high-quality FM sound.[282]

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[272] See *ibid.*
[273] *Ibid.*
[274] See S.E., Schoenherr, "Recording Technology History" (1999) online: University of San Diego <http://ac.acusd.edu/History/recording/notes.html> (last modified: 16 August 1999).
[275] *Ibid.*
[276] See *Recording Studio Technology, supra* note 268.
[277] See Schoenherr, *supra* note 274.
[278] See *ibid.*
[279] *Recording Studio Technology, supra* note 268.
[280] See *ibid.*
[281] See Schoenherr, *supra* note 274.
[282] See *Recording Studio Technology, supra* note 268.

Sony introduced an 8-mm format in April 1985. The same year, the VHS group, led by JVC, brought out a compact version of the VHS recorder, known as VHS-C, that recorded for 20 minutes.[283] Finally, in 1986, Sony lost the battle of the formats and withdraw the Betamax from the market.[284] At that time, North Americans possessed twenty-eight percent (28%) of the videotapes distributed worldwide.[285]

Sony's aggressive marketing of home videotapes in the 1970's disturbed the owners of copyrighted television programs. Advertisements promoting the copying of their work did not go unnoticed. Before videotape recording became commonplace and despite the Supreme Court's decision in *Williams and Wilkins*, Universal Studios and Walt Disney decided to file a lawsuit against the Betamax producer.

They brought forward an action in the Federal District Court,[286] alleging that videotape consumers had been recording copyrighted works exhibited on commercially sponsored television, thereby infringing their copyrights. They alleged that Sony was liable for the copyright infringement because it marketed the video cassette recorders. Copyright owners sought monetary damages, an equitable accounting of profits, and an injunction against the manufacturing and marketing of VTRs. The District Court denied all these demands, holding that noncommercial home recording of material broadcast over the public airwaves was a fair use of copyrighted works and did not constitute copyright

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[283] See Schoenherr, *supra* note 274.
[284] See *ibid.*
[285] See D. Diserens, *La location de videogrammes et de phonogrammes en droit d'auteur* (Genève : Librairie Droz,1986) at 18.
[286] See *Universal City Studios* v. *Sony Corp. of America*, 480 F. Supp. 429 (C. D. Cal. 1979) [hereinafter *Sony District Court*]. See also V. Nabhan " Quelques aspects des problèmes juridiques posés par la vidéoreproduction : l'affaire Betamax et ses répercussions au Canada " (1980) 1 R.C.D.A. 7.

infringement. Therefore, Sony could not be held liable as a contributory infringer even if the home use of VTRs was considered as an infringing use.[287]

The Court of Appeals for the Ninth Circuit reversed the District Court's judgment,[288] holding that Sony was liable for contributory infringement. It ordered the District Court to fashion an appropriate relief.[289]

The action was brought before the Supreme Court,[290] which rendered its decision on 7 January 1984. After much discussion,[291] and with a majority of only five, the Supreme Court declared that the sale of the VTR's to the general public did not constitute contributory infringement of Walt Disney or Universal Studio's copyrights:

> (a) The protection given to copyrights is wholly statutory, and, in a case like this, in which Congress has not plainly marked the course to be followed by the judiciary, this Court must be circumspect in construing the scope of rights created by a statute that never contemplated such a calculus of interests. Any individual may reproduce a copyrighted work for a "fair use"; the copyright owner does not possess the exclusive right to such a use.
> (b) Kalem Co. v. Harper Brothers does not support respondents' novel theory that supplying the "means" to accomplish an infringing activity and encouraging that activity through advertisement are sufficient to establish liability for copyright infringement. This case does not fall in the category of those in which it is manifestly just to impose vicarious liability because the "contributory" infringer was in a position to control the use of copyrighted works by others and had authorized the use without permission from the copyright owner. Here, the only contact between petitioners and the users of the VTR's occurred at the moment of sale. And there is no precedent for imposing vicarious

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[287] See *Sony District Court, ibid.*

[288] See *Universal City Studios* v. *Sony Corp. of America*, 659 F.2d 963 (9th Cir. 1981).

[289] See R. Pepin, "Les appareils vidéo et le droit d'auteur : l'affaire Betamax devant la Court of Appeals" (1983) 14 R.G.D. 449.

[290] See *Universal City Studios* v. *Sony Corp. of America*, 464 U.S. 417 (1984) online: FindLaw <http://www.findlaw.com/casecode/supreme.html> (date accessed: 4 September 1999)) [hereinafter *Sony*].

[291] Numerous discussions were held among the Justices. See Goldstein, *supra* note 17 at 149ff.

> liability on the theory that petitioners sold the VTR's with constructive knowledge that their customers might use the equipment to make unauthorized copies of copyrighted material. The sale of copying equipment, like the sale of other articles of commerce, does not constitute contributory infringement if the product is widely used for legitimate, unobjectionable purposes, or, indeed, is merely capable of substantial noninfringing uses.
> (c) The record and the District Court's findings show (1) that there is a significant likelihood that substantial numbers of copyright holders who license their works for broadcast on free television would not object to having their broadcast time-shifted by private viewers (i.e., recorded at a time when the VTR owner cannot view the broadcast so that it can be watched at a later time); and (2) that there is no likelihood that time-shifting would cause nonminimal harm to the potential market for, or the value of, respondents' copyrighted works. The VTR's are therefore capable of substantial noninfringing uses. Private, noncommercial time-shifting in the home satisfies this standard of noninfringing uses both because respondents have no right to prevent other copyright holders from authorizing such time-shifting for their programs, and because the District Court's findings reveal that even the unauthorized home time-shifting of respondents' programs is legitimate fair use.[292]

Judge Stevens, writing for the majority, first looked at the findings of both parties concerning the use and effect of the Betamax. The copyright owners and Sony had conducted surveys of the way the Betamax machine was used by owners during a sample period in 1978. Both surveys showed that the primary use of the machine for most owners was "time-shifting" and that programs were later erased. The time-shifting practice enabled viewers to see programs they otherwise would have missed because they were not at home, were occupied with other tasks, or were viewing a program on another station. However, both surveys also showed that a substantial number of interviewees had accumulated libraries of tapes. Sony's survey also indicated that over 80% of the interviewees watched at least as much regular television as they had before owning a Betamax. Walt Disney and Universal Studios offered no evidence of decreased television viewing by Betamax owners.

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[292] *Sony, supra* note 290.

Also, Sony introduced considerable evidence of television programs that could be copied without objection from any copyright holder, with special emphasis on sports, religious, and educational programming. Its survey indicated that 7.3% of all Betamax use was to record sports events, and representatives of professional baseball, football, basketball, and hockey testified that they had no objection to the recording of their televised events for home use.

Universal Studios and Walt Disney Productions offered testimonies of experts concerning the future impact of the unrestricted sale of VTR's on the commercial value of their copyrights. However, based on the District Court's findings, the Supreme Court concluded that they had failed to prove any likelihood of future harm from the use of VTR's for time-shifting.[293]

The Judge then discussed the respondents' arguments on the contributory infringement:

> The two respondents in this case do not seek relief against the Betamax users who have allegedly infringed their copyrights. As was made clear by their own evidence, the copying of the respondents' programs represents a small portion of the total use of VTR's. It is, however, the taping of respondents' own copyrighted programs that provides them with standing to charge Sony with contributory infringement. To prevail, they have the burden of proving that users of the Betamax have infringed their copyrights and that Sony should be held responsible for that infringement.[294]

Stating that the *Copyright Act* does not expressly render anyone liable for an infringement committed by another, the Court debated the application of the *Kalem Co.* v. *Harper Brothers* case:[295]

> Such circumstances were plainly present in Kalem Co. v. Harper Brothers, the copyright decision of this Court on which

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[293] *Ibid.* For a study of the influence of the economic influence of private copying see G. Davies & M. Hung, *Music and Video Private Copying: An International Survey of the Problem and the Law* (London : Sweet & Maxwell, 1993) at 23-28, 29 & 57-66.

[294] *Sony, supra* note 290.

[295] Further discussion of this case can be found at Section 3.4, above.

> respondents place their principal reliance. In Kalem, the Court held that the producer of an unauthorized film dramatization of the copyrighted book Ben Hur was liable for his sale of the motion picture to jobbers, who in turn arranged for the commercial exhibition of the film. Justice Holmes, writing for the Court, explained:
> "The defendant not only expected but invoked by advertisement the use of its films for dramatic reproduction of the story. That was the most conspicuous purpose for which they could be used, and the one for which especially they were made. If the defendant did not contribute to the infringement it is impossible to do so except by taking part in the final act. It is liable on principles recognized in every part of the law."

Walt Disney and Universal Studios argued that *Kalem* proposed that supplying the "means" to accomplish an infringing activity and encouraging that activity through advertisement are sufficient to establish liability for copyright infringement. The Court disagreed with them, stating that it was an argument resting "on a gross generalization that cannot withstand scrutiny".[296] The Court observed that the producer in *Kalem* did not merely provide the "means" to accomplish an infringing activity, he had supplied the work itself, but in a new medium of expression. However, Sony did not supply Betamax consumers with Universal Studios and Walt Disney's works, they did that themselves. Sony only supplied a piece of equipment generally capable of copying the entire range of programs that may be televised: those that are uncopyrighted, those that are copyrighted but may be copied without the objection of the copyright holder, and those that the copyright holder would prefer not to have copied. Because it was possible to use the Betamax to make authorized or unauthorized copies of copyrighted works, the Court held that the range of its potential use was much broader than the particular infringing use of the film Ben Hur involved in *Kalem*. Therefore, the Court concluded that the *Kalem case* did not support Universal Studios and Walt Disney's theory of liability.[297]

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[296] *Sony, supra* note 290.
[297] See *ibid.*

In concluding this point, the Court stated that if vicarious liability was to be imposed on Sony in this case, it must rest on the fact that it had sold equipment with the knowledge that customers would use that equipment to make unauthorized copies of copyrighted material. Because there was no precedent in copyright law for the imposition of vicarious liability on such a theory, the Court refused Universal Studios and Walt Disney's argument. [298]

The Court finally stated that the sale of copying equipment, like the sale of other articles of commerce, did not constitute contributory infringement if the product was merely capable of substantial noninfringing uses. In the case of the Betamax, Judge Stevens declared that the sale of the product did not constitute copyright infringement because the noncommercial time-shifting practice satisfied this standard:

> It does so both (A) because respondents have no right to prevent other copyright holders from authorizing it for their programs, and (B) because the District Court's factual findings reveal that even the unauthorized home time-shifting of respondents' programs is legitimate fair use. [299]

The Court decided that Universal Studios and Walt Disney had no right to prevent other copyright holders from authorizing the time-shifting practice for their programs. Even if they did own a large inventory of valuable copyrights, in the total spectrum of television programming their combined market share was well below 10%. Moreover, the District Court held that time-shifting might enlarge the total viewing audience and that there were many important producers of national and local television programs who found nothing objectionable about it.

Judge Stevens also stated that unauthorized time-shifting by Betamax owners over the respondents' copyrighted TV shows was fair use. Because time-shifting expanded public access to free television programs, it yielded societal benefits.

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[298] See *ibid.*

In the Court's point of view, this premise supported an interpretation of the "fair use" concept that required the copyright holder to demonstrate some likelihood of harm before he could condemn a private act of time-shifting as a violation of federal law. The Supreme Court concluded that Sony had demonstrated a significant likelihood that a substantial number of copyright holders licensing their works for broadcast on television would not object to having their programs time-shifted by private viewers and that the respondents had failed to prove that time-shifting would cause any likelihood of non-minimal harm to the potential market of their copyrighted works. Based on this assumption, Judge Stevens decided that the Betamax was capable of substantial noninfringing uses and that Sony's sale of such equipment could not constitute contributory infringement of copyright.[300]

Following this decision, the American legislature decided not to regulate the VTR,[301] and Canadian copyright adopted the same attitude.[302] Therefore, following the spirit of the *Wilkins & Wilkins* decision, North American copyright decided not to include videotape technology within its scope. This decision illustrated a change of attitude in the treatment given to future technologies.

Because the American Supreme Court and both the Canadian and American legislatures decided not to regulate the use and distribution of VTRs on a copyright basis, it can be affirmed that North American copyright did not delay

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[299] *Ibid.*

[300] For further comments on this affair, see Davies & Hung, *supra* note 293 at 206-207; Goldstein, *supra* note 17 at 144-157; V. Nabhan "Quelques aspects des problèmes juridiques posés par la vidéoproduction: l'affaire Betamax" (1981) 108 R. I. D.A. 25; Martin, *supra* note 258 at 49ff; C.D. Van Dyck,m "Past-Forward: A Canadian Perspective on the Betamax Controversy" (1984) 16 Ottawa L. Rev. 506; *Franklin Pierce Law Center's Seventh Biennial Intellectual Property System Major Problems Conference: Digital Technology and Copyright: A threat or A Challenge?* (1999) 39 J. L. & Tech. 291 at 305.

[301] See *ibid.*

[302] See *Tom Hopkins International* v. *Wall & Redekop Realty*, [1984] 5 W.W.R. 555 (B.C. S.C.); B.M. Green "Copyright in Videotape: *Tom Hopkins International* v. *Wall & Redekop Realty*" (1985) 1 I.P.J. 180; S. W.L. Hayhurst, "Copyright and the Copying Machine: the Amstrad Case" (1986) Can Bus. L.J. 331; S. Shemel & W. Krasilovsky, *This Business of Music* (New York: Billboard Publication, 1985) at 144; S. Brill, "Will Betamax be Busted?" in G.P. Bush & R.H. Dreyfuss, eds., *Technology and Copyright* (Mt. Airy, Maryland: Lomond Books, 1979) 317.

the development of videotape recorders. If Sony finally stopped producing the Betamax, it is only because the company lost its commercial battle with the VCR format.[303] The videotape recorder has been constantly improved, and nowadays, the device is still widely used in both Canada and the United States.[304]

3.9. Digital Audio Tape

The next technology to challenge copyright protection was the Digital Audio Tape (DAT). The study of its evolution permits us to look at the history of the music industry.

In 1898, Valdemar Poulsen, a German, invented the first magnetic tape recorder. The device used a steel wire to record magnetised pulses resulting from encoding sound waves. Improvements to this technology produced the magnetic tape, which was a thin plastic tape coated on one side with magnetic oxide. Sound was recorded by a microphone that transformed sound waves to small electrical pulses. The magnetic tape was drawn over a recording head that registered a signal in the magnetic oxide. This signal could be heard by passing the tape over a playback head that converted the signal to electrical pulses, which were electrically amplified and transformed into sound waves by loud speakers. The quality of the sound recording depended on the width of the tape and on the speed at which it passed over the heads.[305]

It was not until after World War II that North Americans became interested in this new technology. The first major American corporation to develop high quality magnetic tapes was the 3M Company (Minnesota Mining and

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[303] See *supra* note 284 and accompanying text.

[304] In 1995, the revenues produced by the sale of videocassettes were $717 million in Canada. See *supra* note 194.

[305] See *A Brief History of Sound and Music Recording* (1996) online: Solstice <http://www.solstice.demon.co.uk/rechist.htm> (last modified: 19 August 1996) [hereinafter *History of Sound*].

Manufacturing). Its engineers produced professional tape recorders, which became the alternative to direct recording onto wax or acetate.[306]

An important innovation of the new medium was its reusability. Never before had the possibility of using the same materiel for production of different recordings been available. Moreover, the recording quality of the tape matched and surpassed that of the old direct recording process. Due to those advantages, high fidelity magnetic tapes became the industry standard.[307]

The next step was to enter the consumer market. In 1964, Phillips marketed the first encased audio tapes, and within a few years eight-track cartridges emerged as the front-runner in a market that included four-tracks and cassettes. The commercial battle was won by the "compact cassette".[308] This now common form of magnetic tape enclosed the tape bobbins in a fixed housing, making it portable. The popularity of the device was based on its small size, even through the small width of the tape reduced the recording quality.[309] In 1969, Dolby Noise Reduction answered that problem by reducing the unpleasant hiss that was heard when listening to such tapes.[310]

In 1987,[311] Sony introduced the Digital Audio Tape (DAT) and its recorder to the semi-professional and professional recording studio market. The technology was a combination of the helical-scan recording technology used for video signals and the latest audio recording methods. The device, which offered 3

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[306] G. Rubinstein, "Audio Recording History and Development" (1999) online: Jones Telecommunications & Multimedia Encyclopedia <http://www.digitalcentury.com/encyclo/update/audiohd.html#Digital> (date accessed: 4 September 1999) [hereinafter "Audio Recording History"].

[307] See *History of Sound*, *supra* note 305.

[308] *Ibid.*

[309] For an overview of the music tape market in the United States, see Davies & Hung, *supra* note 293 at 20.

[310] See *History of Sound*, *supra* note 305.

[311] See F. Arzeno, "Welcome to DAT World" (1999) online: Digital Experience <http://perso.club-internet.fr/farzeno/edat.htm> (last modified: 7 May 1999) [hereinafter "DAT World"]; *History of Sound*, *supra* note 305. However, some affirm that it was in the 1970s (see "Audio Recording History", *supra* note 306), or in 1986 (Goldstein, *supra* note 17 at 158).

hours of digital sound on a tape half the size of an analog cassette tape, did not use data compression. Therefore, as with compact disk technology, the entirety of the signal was retained. The analogue sound waves were sampled at a high frequency and converted to digital data, which were then stored and manipulated by computers.[312] Once in digital format, the data could be stored more reliably on magnetic tape. The digital signal was then converted back to an analogue signal to produce the vinyl master disc.[313]

The quality of the digital tape format was such that professional studios very quickly adopted it and made it the digital standard for recording. In 1992, 80% of recording studios were using this type of machine.[314] Moreover, DAT features permitted indexing, facilitating the listener to locate any place on the tape, and extremely fast rewinding, which permitted the listener to easily access any part of the recording.[315]

An important characteristic of the DAT was its capability to make copies. Contrary to the compact disk, it allowed consumers to produce copies having a crystalline sound quality and, unlike analog tapes, the user could make copies of copies without losing the high quality sound.

With the imminent introduction of the technology to home consumers, record companies feared that flawless copies would decrease sales of their products. In North America, the Recording Industry Association of America (RIAA)[316] was

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[312] For more information on the different ways of converting from analogue to digital, see Sterling, *supra* note 182 at 36ff. For a look at problems created by the manipulation of digital sound, see M. Desjardins, "L'échantillonnage du son en digitales et le droit d'auteur au Canada" (1991) 3 C.P.I 205; M.G. Quail, "Digital Samplers: Can Copyright Protect Music from the Numbers Game?" (1991) 7 I.P.J. 39; J.-C. Risset, *The Development of Digital Techniques: A Turning Point for Electronic Music?* (Paris: IRCAM, 1978).

[313] See "DAT World", *supra* note 311.

[314] See *History of Sound*, *supra* note 305.

[315] See "DAT World", *supra* note 311.

[316] In 1999, the RIAA represented roughly half a dozen major record companies and the artists on their labels that control approximately ninety percent of the distribution of recorded music in the United States. *Recording* v. *Diamond*, U.S. 9th Cir. (15 June 1999) online: FindLaw

examining ways to prevent the distribution of DAT recorders.[317] The late 1980's saw the introduction, in the American House and Senate, of bills requesting the incorporation of a copyguard system for digital recording equipment sold in the United States. After the National Bureau of Standards reported that no system could effectively prevent the copying of copyrighted work without impairing the sound quality or obstructing the recording of uncopyrighted works, the bills were dropped.[318]

Because they needed the record industry's cooperation to produce popular prerecorded digital tapes, DAT equipment manufacturers were open to discussion with their opposition. In summer 1989, record companies and consumer electronic company representatives met in Athens, Greece,[319] where they reached a compromise on the DAT problem: the Serial Copy Management System (SCMS) would be integrated into non-professional DAT recorders, allowing the machine to copy an original prerecorded cassette but blocking it from making a copy of a copy.[320] The original prerecorded tape could be copied endlessly. This agreement had to be implemented by legislation.

The Athens Agreement conciliated American record companies and equipment manufacturers' positions, but did not take into account composers and music publishers' interests. In 1990, when a bill requiring the adoption of the SCMS standard for digital tape recording was presented to the American Congress, songwriters and music publishers opposed it because the bill had no provisions concerning royalties. They pleaded for a royalty to compensate for the loss of revenues created by home taping. Negotiations began between the National Music Publishers' Association, the Recording Industry Association, and

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<http://caselaw.findlaw.com/scripts/casesearch.pl?CiRestriction=Liebling&court=circs> (date accessed: 5 September 1999) [hereinafter *Diamond*].

[317] For more information about the proposed method to prevent the copyright infringement by the DAT, see E. Fleischmann, "The Impact of Digital Technology on Copyright Law" (1988) 70 J.P.T.O. 5.

[318] Goldstein, *supra* note 17 at 160.

[319] See *ibid.* at 160; Davies & Hung, *supra* note 293 at 112-113.

[320] Davies & Hung, *ibid* at 113 & 203.

equipment manufacturers. They finally reached an agreement that required not only the incorporation of the SCMS standard in DAT equipment but also a statutory levy of two percent of the sales price to be paid by producers of blank DATs and of three percent to be paid by DAT equipment producers.[321]

This agreement led to the American *Audio Home Recording Act of 1992*,[322] signed into law by President George Bush in October 1992.[323] The levies collected were deposited to the Copyright Office, where they were divided into funds to be distributed annually, two-thirds to the Sound Recording Fund and one-third to the Musical Works Fund. The Sound Recording Fund was divided between the background musicians and vocalists on the recording, the record company and the featured recording artists. The Musical Works Fund compensated the publishers and writers.[324]

The *Audio Home Recording Act of 1992* [325] prohibits judicial actions against copyright infringement by a private noncommercial copy of a prerecorded tape, also known as home copying.[326] Even though the *Act* does not exclude the DAT from copyright protection and home copying can still be considered as copyright infringement, no action can be initiated since the *Act* requires that levies be paid to the Copyright Office to compensate for possible loss of revenues.

Contrary to expectations, DAT technology was not popular.[327] There are numerous explanations for this. It could be due to a lack of pre-recorded

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[321] See Goldstein, *supra* note 17 at 162; Davies & Hung, *ibid.* at 115 & 202-204.
[322] See *American Copyright Act*, supra note 2, c. 10.
[323] See Davies & Hung, *supra* note 293 at 201-202.
[324] See *ibid.* at 204-207.
[325] See *American Copyright Act*, *supra* note 2, c. 10.
[326] For a Canadian perspective on home copying, see P.D. Hitchcock, "Home Copying and Authorization" 67 C.P.R. (2d) 17 and S. Martin " La renumeration pour copie privée" (1998) 11 C.P.I. 327.
[327] See *History of Sound*, *supra* note 305. In 1994, sales of sound recording devices other than CDs and analog tapes were too small to be expressed in the Canadian Statistics. See *Revenues in the sound recording industry* online: Statistics Canada <http://www.statcan.ca/english/Pgdb/People/Culture/arts28.htm> (date accessed: 3 November 1999).

tapes.[328] Popular titles must be available to the public for it to be interested in the technology. Another explanation could be that consumers were not willing to invest in new equipment since this would have involved buying favorites tapes again and investing in a technology that might not be available for the long term.[329]

Chances are that the implementation of the SCMS in the device had a negative impact on the technology's popularity. The principal concurrent of the DAT was the compact disc, which permits random access to its content. The DAT, even though it allows the listener to index the tape and to rewind at an extremely fast pace, implies going through the whole tape to find a particular song. One of the advantages of the DAT was its ability to make copies, and limiting this feature certainly lowered the popularity and consequently the distribution of the device.

Another negative factor might have been the levy on blank DATs and DAT equipment. This tax increased the price of the equipment and tapes. This additional obstacle rendered the commercial battle with the compact disk more difficult to win.

But is copyright responsible for the emergence of those difficulties? The legislation is based on a commercial agreement that was made possible because the RIAA had an exclusive right to record some popular songs. The DAT equipment manufacturers wanted to produce pre-recorded DAT tapes with those songs. Therefore, the parties reached a compromise because of the copyright characteristics.

Even if copyright did not directly delay DAT technology, its indirect influence might have contributed to the diminished popularity of the device. This is one

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[328] See *History of Sound, ibid.*
[329] See *ibid.*

example where North American copyright seems to have hindered technological development.

3.10. MP3 player

In the late 1990's, another recording technology challenged copyright. The MP3 format is a digital audio compression algorithm used mostly on the Internet. The primary characteristic of this system is its ability to compress large files into a more manageable size without any recognizable loss of quality.[330] One of the leaders in developing this new format was the Fraunhofer Institut in Denmark, which used the compression CODEC (MPEG-3) for television and radio broadcasts of the Winter Olympics in Albertville.[331]

Before the compression algorithm, the Internet was impractical for distributing music because of the great size of the digital files. Downloading a song from the World Wide Web took many hours, and saving this information required several floppy disks. With compression, which makes "an audio file 'smaller' by limiting the audio bandwidth",[332] digital audio files can be transferred quickly and stored more efficiently. Due to its availability to the general public, unlike its competitor copyrighted algorithms, the most popular web based compression algorithm is the MPEG-1 Audio Layer 3, also named "MP3". It can reduce the size of files by a factor of twelve without notably affecting sound quality.[333]

With cable modems, it is possible for the average user to download on his personal computer a high quality audio file within a few minutes, or even seconds. Seizing the opportunity, some organizations began to make music available through the Internet:

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[330] See Genocide "History of MP3" (1998) online: Dimension music <http://www.dmusic.com/articles/hist1.txt> (date accessed: 15 September 1999).

[331] See *About Ourselves* (1999) online: Fraunhofer-Gesellschaft <http://www.iis.fhg.de http://www.fhg.de/english/company/index.html> (date accessed: 15 September 1999).

[332] *Diamond, supra* note 316.

[333] See T. Verbiest, "La révolution du MP3" (1999) online: Juriscom <http://www.juriscom.net/> (last modified: 17 June 1999).

> To utilize these tools, the first MP3 audio groups were created. Here is where the MP3 scene theories will differ. As one of the first people in the groups: DMA and CDA, I know which was the absolutely first group. However, many opinions within the scene will differ. DMA, Digital Music Audio (now defunct), was the very first MPEG-3 Audio group. Existing from approximately January 1995-Summer 1995, DMA was the first group to actually rip tracks off an audio CD and make them available via an FTP site.
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> How do I have such knowledge? I was one of the first people to do so with Toad The Wet Sprocket's "All I Want". Despite being the first MP3 group, DMA was very limited and never officially opened its' doors to an MP3 scene. This is where CDA comes into play.
>
> Public announcement breeds growth. When CDA released the first publically, group-released mp3's, it bred many other groups. Netfrack, the original leader of CDA, ran the group well, and in time, such highly regarded groups to the liking of Rabid Neurosis (RNS) and Digital Audio Crew (DAC) began to see the light of day.
>
> With the many different groups that came out of the MP3 scene, there were many different specializations. Rabid Neurosis, for example, was known mainly for releasing the rare/uncommon, yet quality rips, whereas DAC and CDA would release more "mainstream" material.[334]

Various pirate websites began to offer free downloads of copyrighted material; a single pirate site could distribute thousands of pirated audio computer files. However, before 1999, MP3 users were limited to listening to their downloaded songs through their personal computer, playing them from their hard drives. This restricted use of the MP3 limited the format's popularity.

But then Diamond Multimedia Systems produced "Rio", the first portable MP3 reader.

> The Rio renders these [MP3] files portable. More precisely, once an audio file has been downloaded onto a computer hard drive from the Internet or some other source (such as a compact disc player or digital audio tape machine), separate computer

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[334] Genocide, *supra* note 330.

> software provided with the Rio (called "Rio Manager") allows the user further to download the file to the Rio itself via a parallel port cable that plugs the Rio into the computer. The Rio device is incapable of effecting such a transfer, and is incapable of receiving audio files from anything other than a personal computer equipped with Rio Manager. Generally, the Rio can store approximately one hour of music, or sixteen hours of spoken material (e.g., downloaded newscasts or books on tape). With the addition of flash memory cards, the Rio can store an additional half-hour or hour of music. The Rio's sole output is an analog audio signal sent to the user via headphones. The Rio cannot make duplicates of any digital audio file it stores, nor can it transfer or upload such a file to a computer, to another device, or to the Internet. However, a flash memory card to which a digital audio file has been downloaded can be removed from one Rio and played back in another.[335]

Since the format appeared in the mid-1990s, the Recording Industry Association of America (RIAA)[336] has been attentive to the MP3's evolution. The Association has fought a constant battle against Internet piracy, monitoring the Internet daily and routinely shutting down pirate websites by sending cease-and-desist letters and filing lawsuits. The appearance of the first portable reader alarmed the RIAA. Using the *Audio Home Recording Act of 1992*,[337] the organization filed a lawsuit to prevent the manufacturing and distribution of the Rio. The recording industry argued that the Rio did not meet the requirements for digital audio recording devices under the *Act* because it did not use the SCMS feature, which limited copying of copyrighted material.[338] The RIAA also sought payment of the royalties seemingly due by Diamond as the manufacturer and distributor of a digital audio recording device.

The American District Court denied the recording industry's motion for a preliminary injunction, holding that the Association's likelihood of success on the

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[335] *Diamond*, *supra* note 316.
[336] See Section 3.9, above.
[337] See *American Copyright Act*, *supra* note 2, chap. 10.
[338] At the time the preliminary injunction was sought and denied, the Rio machine did not incorporate SCMS. While the decision was pending, Diamond incorporated the system into the Rio Manager software but not into the Rio device itself. See *Diamond*, *supra* note 316.

merits was mixed and that the balance of hardships did not tip in its favor.[339] The RIAA appealed this decision.

The recording industry argued that Internet distribution of serial digital copies of pirated copyrighted material would discourage the purchase of legitimate recordings. They evaluated losses due to digital Internet piracy at $300 million more than what was allegedly lost annually due to other more traditional forms of piracy. This anticipated financial loss was contradicted by Diamond's lawyers, who maintained that willingness to download illicit files for free did not necessarily correlate to lost sales. Just because a person was willing to accept an item for free did not mean that she would purchase the same item, even if it were no longer freely available. Moreover, they argued that the Internet supported burgeoning traffic in legitimate audio computer files. Many unsigned artists distributed their music from their own websites. Some record labels sold and provided free samples of their artists' work online for marketing purposes. Also, a new industry promoting the purchase of mail order recordings or recordings available for direct download were using the MP3 distribution tactics.

On 15 June 1999, the American 9th Circuit Court of Appeals rendered a decision in *Recording Industry Association of America* v. *Diamond Multimedia Systems*.[340] The Court adopted a pragmatic approach and limited its analysis to whether the Rio portable music player was a digital audio recording device subject to the restrictions of the *Audio Home Recording Act of 1992*.

The Court observed that the *Act* does not broadly prohibit digital serial copying of copyright protected audio recordings; it places restrictions only upon a specific type of recording device. The *Act* provides that no one shall import, manufacture, or distribute any digital audio recording device that does not conform to the SCMS or a system having the same characteristics. The *Act* also

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[339] See *Recording Indus. Ass'n of America, Inc.* v. *Diamond Multimedia Sys.*, 29 F. Supp. 2d 624 (C.D. Cal. 1998).

states that no one shall import into and distribute, or manufacture and distribute, any digital audio recording device except a person who records the notice specified by the *Act* and deposits the statements of account and the applicable royalty payments. Therefore, the Court stated that to fall within the *Audio Home Recording Act of 1992* scope, the Rio must be a "digital audio recording device".

The legal notion of "digital audio recording device" is defined in the *Act* through a set of definitions:

> A "digital audio recording device" is any machine or device of a type commonly distributed to individuals for use by individuals, whether or not included with or as part of some other machine or device, the digital recording function of which is designed or marketed for the primary purpose of, and that is capable of, making a *digital audio copied recording* for private use, except for :
>
> (A) professional model products, and
> (B) dictation machines, answering machines, and other audio recording equipment that is designed and marketed primarily for the creation of sound recordings resulting from the fixation of nonmusical sounds.[341]

> A "digital audio copied recording" is a reproduction in a digital recording format of a *digital musical recording*, whether that reproduction is made *directly* from another digital musical recording or *indirectly from a transmission*.[342]

Consequently, to determine whether the Rio was included within the jurisdiction of the *Audio Home Recording Act of 1992*, the Court of Appeals had to analyze whether the machine was able to reproduce, either directly or from a transmission, a digital music recording.

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[340] See *Diamond, supra* note 316.

[341] *American Copyright Act, supra* note 2 §1001(3) [emphasis added].

[342] *Ibid.* §1001 (1) [emphasis added].

The Court first considered whether the Rio was able to reproduce a digital musical recording directly from another digital musical recording. The definition of a digital musical recording is:

> A "digital musical recording" is a material object
> (i) in which are fixed, in a digital recording format, only sounds, and material, statements, or instructions incidental to
> those fixed sounds, if any, and
> (ii) from which the sounds and material can be perceived, reproduced, or otherwise communicated, either directly or with the aid of a machine or device.
> A "digital musical recording" does not include a material object -
> (i) in which the fixed sounds consist entirely of spoken word recordings, or
> (ii) in which one or more computer programs are fixed, except
> that a digital musical recording may contain statements or instructions constituting the fixed sounds and incidental material, and statements or instructions to be used directly or
> indirectly in order to bring about the perception, reproduction, or communication of the fixed sounds and incidental material.[343]

The Court observed that the typical computer hard drive from which a Rio directly records is a material object. However, this hard drives contain much more than "only sounds, and material, statements, or instructions incidental to those fixed sounds."[344] The Court also observed that common hard drives contain numerous computers programs and databases that are not incidental to the sound files that may be stored on them. Therefore, the computer hard drive from which the Rio records does not qualify as a "digital musical recording" because the *Act* expressly excludes from the "digital musical recording" definition a material object in which one or more computer programs are fixed.

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[343] *Ibid.* §1001 (5).
[344] *Ibid.*

Even though this finding already excluded the Rio from directly reproducing a digital music recording, the Court secured its position by justifying this exclusion with the legislative history of the disposition.

> The Senate Report states that "if the material object contains computer programs or data bases that are not incidental to the fixed sounds, then the material object would not qualify" under the basic definition of a digital musical recording. The Senate Report further states that the definition "is intended to cover those objects commonly understood to embody sound recordings and their underlying works." A footnote makes explicit that this definition only extends to the material objects in which songs are normally fixed: "[t]hat is recorded compact discs, digital audio tapes, audio cassettes, long-playing albums, digital compact cassettes, and mini-discs." There are simply no grounds in either the plain language of the definition or in the legislative history for interpreting the term "digital musical recording" to include songs fixed on computer hard drives.
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> RIAA contends that the legislative history reveals that the Rio does not fall within the specific exemption from the digital musical recording definition of "a material object in which one or more computer programs are fixed." The House Report describes the exemption as "revisions reflecting exemptions for talking books and computer programs." We first note that limiting the exemption to computer programs is contrary to the plain meaning of the exemption. As Diamond points out, a computer program is not a material object, but rather, a literary work that can be fixed in a variety of material objects ("Literary works' are works . . . expressed in words, numbers, or other verbal or numerical symbols or indicia, regardless of the nature of the material objects, such as books . . . tapes, disks, or cards, in which they are embodied.").
>
> Thus, the plain language of the exemption at issue does not exclude the copying of programs from coverage by the Act, but instead, excludes copying from various types of material objects. Those objects include hard drives, which indirectly achieve the desired result of excluding copying of programs. But by its plain language, the exemption is not limited to the copying of programs, and instead extends to any copying from a computer hard drive.

The Court stated that under the plain meaning of the *Act*'s definition of "digital audio recording", computer hard drives are not digital audio recording devices

because their primary purpose is not to make digital audio copied recordings. The Court observed that unlike DAT machines, whose primary purpose is to copy digital audio recordings, the primary purpose of a computer is to run various programs and to record the data necessary to run those programs and perform various tasks. Consequently, the Court concluded that the legislative history of the *Audio Home Recording Act* was consistent with its conclusion that personal computers should not fall within the definition of "digital audio recording".[345]

Based on the *Act's* definitions, the Court concluded that the Rio did not make direct copies from digital music recordings, and thus would not be a digital audio recording device under the *Audio Home Recording Act of 1992* unless it were to make copies from transmissions.[346]

In viewing computers as non-digital audio recording devices, the Court also concluded that they were not required to comply with the SCMS requirement. Judge O'Scannlain, who wrote the majority decision, stressed that, in practice, the majority of MP3 files do not even carry codes providing information used by the SCMS device to determine copyright and generation status. Therefore, the incorporation of SCMS into the Rio would allow the Rio to copy MP3 files lacking SCMS codes so long as it marked the copied files with an original generation status. In fact, without SCMS the Rio inherently allows less copying than SCMS permits. The Rio does not allow further copies to be made because it cannot download or transmit the files that it stores, but, the SCMS system would allow an SCMS device to make unlimited copies of an original generation file.

The Court also analyzed the Rio's capacity to reproduce a digital music recording from a transmission. This ability could still qualify the Rio system as a digital recording device.

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[345] *Ibid.*
[346] See *Diamond, supra* note 316.

> The term "transmission" is not defined in Act, although the use of the term in the Act implies that a transmission is a communication to the public. (placing restrictions upon "[a]ny person who transmits or otherwise communicates to the public any sound recording in digital format") In the context of copyright law (from which the term appears to have been taken), "[t]o transmit' a performance or display is to communicate it by any device or process whereby images or sounds are received beyond the place from which they are sent." The legislative history confirms that the copyright definition of "transmission" is sufficient for our purposes here. The Act originally (and circularly) provided that "[a] transmission is any audio or audiovisual transmission, now known or later developed, whether by a broadcast station, cable system, multipoint distribution service, subscription service, direct broadcast satellite, or other form of analog or digital communication."

The RIAA and Diamond did not dispute the definition of transmission, but rather, whether indirect reproduction of a transmission of a digital music recording was covered by the *Act*. The RIAA argued that indirect reproduction of a transmission was sufficient for the Rio to fall within the *Audio Home Recording Act's* scope as a digital audio recording device. In response, Diamond asserted that the adverb "indirectly" modifies the recording of the "digital music recording" rather than the recording "from the transmission." Diamond argued that the statute should be read as covering devices that are capable of making a reproduction of a digital musical recording, whether that reproduction was made directly from another digital musical recording or indirectly from a transmission.

The Court observed that while the Rio can only directly reproduce files from a computer hard drive via a cable linking the two devices, which is not considered a transmission, the Rio can indirectly reproduce a transmission. The Court gave the example of a radio broadcast of a digital audio recording recorded on a digital audio tape machine or compact disc recorder and then uploaded to a computer hard drive. In this situation, the Rio could indirectly reproduce the transmission by downloading a copy from the hard drive. Consequently, if an indirect reproduction of a transmission were to fall within the statutory definition, the Rio would be a digital audio recording device.

Analyzing both parties' pretensions, the Court stated that even though the RIAA's interpretation of the "digital audio copied recording" definition initially seemed plausible, a closer analysis revealed that it was contrary to common sense. The focus of the statutory language was on the two means of reproducing the digital music recording, either directly from that recording, or indirectly, by reproducing the recording from a transmission. The Court underlined that the RIAA's interpretation of the *Act* would only cover the indirect recording of transmissions and would omit restrictions on the direct recording of transmission from the *Act*'s scope. The Court refused to adopt this interpretation, arguing that it would significantly reduce the protection afforded by the *Act* to transmissions, and that neither the statutory language nor structure provided any reason for the *Act*'s protection to be so limited. The Court added that it made little sense for the *Audio Home Recording Act* to restrict the indirect recording of transmissions but to allow unrestricted direct recording of transmissions. This interpretation of the *Act* would allow unlimited direct recording of songs from the radio, but would lead to regulation of second-hand recordings of such songs. The Court concluded that the most logical reading of the *Act* extends protection to direct copying of digital music recordings, and to indirect copying of digital music recordings from transmissions of those recordings.

However, to support this interpretation, and because of the ambiguity of the provision, the Court also analyzed its legislative history. After examining the Senate Report, Judge O'Scannlain concluded that the recording of a transmission need not be indirect to fall within the scope of the *Act* and interpreted indirectly as modifying the verb "is made". Consequently, the Court concluded that because the Rio cannot make copies from transmissions but instead can only make copies from a computer hard drive, it is not a digital audio recording device, and it is not included in the scope of the *Audio Home Recording Act*.

The Court of Appeals also observed that Rio utilization is consistent with the *Act's* purpose, which is the facilitation of the personal use of works. Referring to the *Sony v. Universal Studios*[347] decision, Judge O'Scannlain argued that Rio users merely make copies in order to render portable or space-shift files already contained in their personal computers' hard drives. Because this copying is for non-commercial personal use, the use of the Rio is consistent with the purposes of the *Act*. The Court concluded:

> For the foregoing reasons, the Rio is not a digital audio recording device subject to the restrictions of the Audio Home Recording Act of 1992. The district court properly denied the motion for a preliminary injunction against the Rio's manufacture and distribution. Having so determined, we need not consider whether the balance of hardships or the possibility of irreparable harm supports injunctive relief.[348]

Until now, the North American legislatures have not placed any restrictions on the MP3 player's distribution.[349] This decision is consistent with the new approach of North American copyright to favor non-commercial use of works and to exclude new technologies from its protective scope. Even though it is too early to evaluate the influence of copyright on the MP3 player's development, we can presume that since the legislatures have refused to regulate the distribution and manufacture of the MP3 player, copyright will not delay its development.

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[347] See Section 3.8, above.

[348] *Diamond, supra* note 316.

[349] See T. Hardy, "The Internet and the Law: Copyright and "New-Use" Technologies" (1999) 23 Nova L. Rev. 657; T. Skelton, "Internet Copyright Infringement and Service Providers: The Case for a Negotiated Rulemaking Alternative" (1998) 35 San Diego L. Rev. 219; Verbies, *supra* note 333; R. Cassius de Linval, "Les fichiers MP3 et la propriété intellectuelle" (1999) 30:15 J. du B. at 8; R. Cassius de Linval, "MP3: la chasse aux contrefacteurs est ouverte" (1999) 30:16 J. du B. at 8; M.-H., Deschamps-Marquis, "Conférence de l'AQDIJ: les MP3 et le droit d'auteur" (1999) 31:17 J. du B. 11 at 11; J.-F. Codère, "Le Rio de Diamond est légal" (1999) online: Multimédium <http://www.mmedium.com/cgi-bin/nouvelles.cgi?Id=2432> (last modified: 15 juin 1999); *Le lecteur MP3 sonnent-il le glas de l'industrie musicale?* (1999) online: Multimédium <http://www.mmedium.com> (last modified: 28 October 1998).

However, the legal treatment given to the MP3 format and the availability of the latter would also influence the evolution of the MP3 player. On 28 November 1998, the American legislature adopted an *Act* that requires that Internet-based MP3 distributors be licensed to use copyrighted works.[350] This approach will probably be followed by the Canadian Copyright Board.[351] However, it is still too early to evaluate the impact of the regulation on the MP3 format. MP3 distributors, copyright actors, and consumers might have to adapt to new technological and legal realities. Therefore, no conclusion can be made concerning the impact of North American copyright on the MP3 player's development.

3.11. Conclusion

The study of technological evolution, from the origins of copyright to the digital era, provides an overview of copyright's reaction to new copying devices. Sometimes North American copyright has been extended to protect authors against the unauthorized reproduction of their works. However, the legal community sometimes has refused to extend copyright protection to regulate new devices. The ways used to express copyright's reaction have also differed. Often introduced by courts, copyright changes have usually been confirmed by the legislature. Consequently, technological development certainly influenced copyright.

As illustrated in this chapter, copyright has had an effect on the evolution of the technologies, sometimes positively, sometime negatively. But on a global basis, has copyright delayed technological development?

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[350] See *Digital Millennium Copyright Act*, H.R. 2281. See also N.W. Whitlock, "IT and the Digital Copyright Dilemma" (1999) online: IT Knowledge Center Article <http://www.intraware.com/ms/mktg/indaa/itkc/digcopyright.html> (date accessed: 1 November 1999); *ASCAP Internet Licensing: Frequently Asked Questions about Internet Licensing* (1999) online: ASCAP <http://www.ascap.com/weblicense/webfaq.html> (date accessed: 1 November 1999); E. Scheirer "Our Rap With ASCAP" (1999) online: MP3.com <http://www.mp3.com/news/413.html?hparticle1> (last modified: 29 October 1999).

[351] See *Tariff 22* supra note 224.

4. CONCLUSION

This thesis has attempted to evaluate whether North American copyright delayed technological development. Copyright has been defined as an exclusive right, including some moral rights, against the distribution of an intellectual creation given to an author or to someone else.[352] The expression "delayed technological development" has been described as affecting negatively the distribution of scientific or mechanical inventions.[353]

It is interesting that the copyright question did not seem to be an issue for the inventors of the devices described in this thesis.[354] It was only during distribution that issues arose, which can probably be explained by the fact that copyright is a complicated legal concept that is difficult to enforce because infringement is usually done in private. Inventors are often unaware of copyright restrictions or are not limited by them because they do not see the practical consequences of copyright infringement.

Copyright has had no impact on the evolution and development of the printing press, the player-piano, cable TV, the photocopier and the videotape recorder. For the cases of the printing press[355] and cable TV,[356] copyright intervention occurred too late to affect the technologies' development. In both situations, when the North American legislatures decided to protect authors against this type of technology, the device was already fully developed and established.

Copyright's impact on player-pianos is more difficult to grasp, but it seems that the positive and negative effects of the right were of no consequence to the

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[352] See, section 2.4, above.
[353] See, section 4.1, above.
[354] It might however have influenced other inventors.
[355] See, section 3.1, above.
[356] See, section 3.6, above.

technology's distribution and popularity.[357] Even though the production of piano rolls was probably more expensive due to copyright restrictions, the popularity of the device was not affected until the Great Depression of 1929.

It took more than sixteen years before copyright adopted a definite position concerning photocopy technology.[358] During this time, the technology was developed and widely distributed. The American Supreme Court chose not to interfere with the use of the technology, and the legislature followed this approach, allowing almost unrestricted use of the device. However, this approach seems not to have influenced the photocopier's evolution.

Finally, North America completely avoided regulating the use of videotape recorders.[359] Considering that users could legally record their favorite TV shows, and that the legal bodies preferred not to regulate the utilisation of the apparatus, it is possible to conclude that copyright did not influence the recorder's development.

However, copyright law sometimes had a positive impact on the technological evolution, as is the case with photography[360] and the motion picture.[361] It took a long time before copyright granted protection to photography, but when it did, it certainly had a positive effect on its development. The protection permitted photographers to have exclusive control over their creations and the distribution of their works. Also, the protection given to photographs taken for commercial purposes increased financial interest in the new medium.

For motion pictures, the inclusion of the new technology in the copyright scope increased investors' interest in the production of the medium. Copyright

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[357] See, section 3.3, above.
[358] See, section 3.7, above.
[359] See, section 3.8, above.
[360] See, section 3.2, above.
[361] See, section 3.4, above.

protection led to high budget movies and their wide distribution. Even though the obligation to pay royalties for the cinematographic adaptation of a novel might have increased production costs, copyright protection probably positively influenced the motion picture's development overall.

The only technologies that appear to have been negatively influenced by North American copyright were radio and the DAT. But, in both cases, the law did not directly influence the devices' evolution. Rather, it was the use of the exclusive right that delayed the technologies' development.

Early on, radio was included in the definition of public performance, an already unauthorized type of reproduction. Copyright made it possible to delay the technology, but the real delaying factor was the abusive utilization of that right by ASCAP. As exposed in last part,[362] the inability to broadcast "hits" certainly diminished the popularity of radio, and even though this situation only existed for a short period of time, we can consider that copyright scarcely delayed its technological evolution and has likely not affected its economical impact.

For DAT technology, the negative impact stemmed from a commercial agreement, which was made possible because the RIAA had an exclusive right to record some popular songs.[363] Due to the copyright issue, the parties agreed on a compromise that influenced the development of the DAT machine. Modifications to the device and the levy on blank DATs and DAT equipment are not the only explanation for the technology's lack of popularity. However, it is one of the most probable causes.

The most recent technology to challenge copyright was the MP3 player.[364] It is still too early to evaluate the impact of copyright on the MP3 format, but the first

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[362] See, section 3.5, above.
[363] See, section 3.9, above.
[364] See, section 3.10, above.

North American decision dealing with this device did not limit its utilisation. The positions that will be adopted by legal bodies over the MP3 format will influence the MP3 player's evolution. The imposition of a levy on Internet servers distributing MP3s might diminish the music's availability. But, because of the Internet's international character, this may lead to a migration of such distributors to servers outside North America and to no difference in the MP3's distribution costs or popularity. In any event, this is pure speculation since it is still too early to make a proper evaluation. Thus, no conclusion can be made concerning the impact of North American copyright on the MP3 player's development.

Obviously, copyright has not had a major influence on the technological evolution. Most of the time, its impact was indirect and lukewarm because it was mixed with other factors. In the two situations where the exclusive right appears to have had a negative effect on the technological evolution, the consequences were not exclusively attributable to copyright and only led to lower popularity of the devices without directly hindering their distribution to the public.

This study has demonstrated that copyright has had both positive and negative effects on technological development. Although the answer to the leading question is that copyright has sometimes delayed technological development, this study may help copyright promoters better argue their position. The historical approach used in this thesis has also granted a unique opportunity to observe reactions to new technologies. It should inspire a new perspective on the attitude to adopt in future conflicts between copyright and technological development.

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