UMass Law Review

Technology Drives the Law: A Foreword to Trends and Issues in Technology & the Law

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7 U. MASS. L. REV. 2

FOREWORD

Technology has always been a motivating force of change in the law. The creation of new machines and development of novel methods of achieving goals force the law to adapt with new and responsive rules. This is particularly true whenever a new technology transforms society. Whether it is increasing industrialization or computerization, pre-existing legal concepts rarely survive the transition unaltered—new prescriptions are announced while old ones disappear.

Consider, for example, how products liability has evolved over time. In the nineteenth century, unless the product was inherently dangerous, direct privity was needed between the injured party and the manufacturer in order to recover in tort. This rule was understandable during the period before the 1900s for two primary reasons. First, the technology of the 1800s and earlier was comprehensible by most. The average person who acquired a product was likely to be able to understand the basic principles by which it operated and, consequently, could evaluate the safety of the product. Second, the manufacturer was likely to be within the same general locale as the final consumer. As neighbors, the purchaser was likely to have known the reputation of the manufacturer and the quality of the products it produced and could avoid acquiring a product from a manufacturer who was not trusted.

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After the turn of the century, improvements in transportation and the mobility of goods in the marketplace made this less common. In the *MacPherson* case, for example, the plaintiff was injured when a wheel on an automobile collapsed.[1] In an earlier time, it would have been unlikely that MacPherson would have purchased a fully-functional vehicle from a manufacturer located half a continent away; instead, he would have acquired it from the local wagon-maker and wheelwright. MacPherson would have known the abilities of his neighbors, and could have inspected the cart and wheel as they were made to discover any defects. By the beginning of the twentieth century, however, the customer in New York was buying a completed product from a retail distributor who had acquired it from the manufacturer in Michigan who had, in turn, acquired the wheel from another manufacturer in some unknown location.[2]

The new technologies of interchangeable parts and mechanized assembly lines allowed this to occur.[3] As the courts recognized in *MacPherson* and similar cases, the industrial age required new rules. The old legal rule that focused on the product's inherent dangerousness no longer served the purpose of promoting safety.[4] With remote customers acquiring technologically sophisticated products, a new rule was needed.[5]

A more comprehensive example of law changing in response to new technology can be found by examining the technology of publishing and the legal response in the form of copyright law, from their foundations in the fifteenth century to today. Before Gutenberg invented the movable type press in 1436,[6] there was no need for copyright law. During that time, a scribe would require hundreds to

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[1] *Id.*

[2] *See id.*

[3] *See generally* Sally H. Clarke, *Unmanageable Risks: MacPherson v. Buick and the Emergence of a Mass Consumer Market*, 23 LAW & HIST. REV. 1, 14–15 (2005) (examining incidents of defects and the need for public and private inspection after automobile mass production was made possible by the assembly line and interchangeable parts).

[4] *See* David G. Owen, *The Evolution of Products Liability Law*, 26 REV. LITIG. 955, 966-69 (2007). *But Cf.* Ultramares Corp. v. Touche, 174 N.E. 441, 445 (N.Y. 1931) ("The assault upon the citadel of privity is proceeding in these days apace.").

[5] *See* Owen, *supra* note 4, at 969.

[6] Peter Burger, *The Berne Convention: Its History and Its Key Role in the Future*, 3 J.L. & TECH 1, 3 (1988).

thousands of hours to hand copy another's work.[7] The inaccuracy and high cost of the process made it prohibitive for most.[8] The movable type press mitigated both of these problems. Although it would take several hours to set each page of a book in type, thousands of copies of the page could be produced rapidly thereafter.[9] Further, as the type was set, errors could be identified and eliminated.[10] Consequently, the overall time it took to accurately reproduce a work dropped dramatically.

The common law system first addressed the changes wrought by the movable type press technology in England. Not long after the invention of the press, the King gave the Stationers Company a royal prerogative to control the publication of books, which included the ability to prohibit piracy.[11] Eventually, the Licensing of the Press Act of 1662 granted the Company complete control over what was printed in England.[12] Not surprisingly, this private control of printing led to abuses stemming particularly from the perpetual protection of works.[13] Parliament responded in 1710 with the Statute of Anne, which established a system of protecting printed works that we can recognize as copyright protection.[14]

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[7] LEILA AVRIN, SCRIBES, SCRIPT AND BOOKS 128 (2010) ("A scribe could write between six and sixteen pages a day, and perhaps wrote for six and seven hours a day in a five- or six-day workweek, excluding holidays.").

[8] *See* ELIZABETH L. EISENSTEIN, THE PRINTING PRESS AS AN AGENT OF CHANGE 46–47 (1979) (Noting, in a discussion of scrivener accuracy versus print accuracy, that ". . .it is doubtful whether one should refer to 'identical copies' being 'multiplied' before print."); *see also id.* at 72 (On cost, the author notes that, after the press, students and scholars could undertake much broader studies because ". . .printing made books cheap and plentiful.").

[9] *See generally* FRAN REES, JOHANNES GUTENBERG: INVENTOR OF THE PRINTING PRESS 50–56 (2006) (explaining movable type setting process).

[10] SABRINA ALCORN BARON ET AL., AGENT OF CHANGE: PRINT CULTURE STUDIES AFTER ELIZABETH L. EISENSTEIN 144 (2007).

[11] Isabella Alexander, *All Change for the Digital Economy: Copyright and Business Models in the Early Eighteenth Century*, 25 BERKELEY TECH. L.J. 1351, 1356–57 (2010) (describing the Licensing Act of 1662). To be fair, it seems clear that the primary goal of the Stationers Company was to censure works that portrayed the King or the Church in an unfavorable light more than it was to provide copyright to authors and publishers. *See id.* at 1356.

[12] *Id.* at 1356–57.

[13] *See id.* at 1357.

[14] *Id.* at 1359 (Most importantly, the Statute of Anne limited the duration of the protections received by an author or publisher.).

In the United States, the Statute of Anne was in force as part of each state's common law as the U.S. established its independence from England.[15] In the first Congress, the Copyright Act of 1790 was passed providing limited nation-wide copyright protection.[16] Similar to the rights afforded by the Statute of Anne,[17] the new Copyright Act gave authors the right to publish and vend books, maps, and charts, and, by its very terms, was limited to preventing verbatim copying of the work.[18] Throughout this time—from the Stationers Company through the adoption of the 1790 Act—publishing technology was stable, subject only to incremental improvement, so no fundamental legal changes were required.[19]

In 1798, however, the invention of the lithographic press radically altered publishing technology and continued the trend of decreasing printing costs.[20] Furthermore, as chromolithography became commonplace in the mid to late 1800s, multi-color printing became practical.[21] With technologically feasible and affordable multi-color printing, such things as posters and pictures could be reproduced with the speed that had previously only applied to text.[22] In response to this technological advancement, Congress amended the Copyright Act in 1831 to begin covering some of these works.[23] However, it was not until the 1870 Act that color lithographs became fully protected by copyright law.[24]

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[15] Molly Shaffer Van Houweling, *Author Autonomy and Atomism in Copyright Law*, 96 VA. L. REV. 549, 585–86 (2010) (describing proliferation of the Statute of Anne into Colonial American state laws).

[16] Copyright Act of 1790, ch. 15, § 1, 1 Stat. 124 (repealed 1831).

[17] *See* Van Houweling, *supra* note 15, at 585–86.

[18] *See supra* note 16, § 1 ("the author . . . of any map, chart, book . . . shall have the sole right and liberty of printing, reprinting, publishing and vending such map, chart, or book for the like term of fourteen years . . .").

[19] ROBERT WEDGEWORTH, WORLD ENCYCLOPEDIA OF LIBRARY AND INFORMATION SERVICES 228–229 (1993).

[20] ELIZABETH R. PENNELL & JOSEPH PENNELL, LITHOGRAPHY AND LITHOGRAPHERS: SOME CHAPTERS IN THE HISTORY OF THE ART 5, 238 (1915).

[21] DAVID PANKOW, TEMPTING THE PALETTE: A SURVEY OF COLOR PRINTING PROCESSES 32 (2005).

[22] *See id.*

[23] *See* Copyright Act of 1831, ch. 16, §§ 1, 7, 4 Stat. 436, 436, 438 (repealed 1870) (The Act also provided for copyright protection for musical compositions for the first time.).

[24] Copyright Act of 1870, ch. 230, § 86, 16 Stat. 198, 212 (repealed 1909).

In the last century, the speed of technological innovation increased significantly. Six major newly developed technologies stressed the bounds of copyright law: recorded music, movies, radio, television, photocopiers, and computers.[25] Congress' first response to these new technologies was to repeatedly amend the Copyright Act until finally, in the mid-1970s, a completely new approach was used.

The first major technology faced by Congress was the mechanical reproduction of sound.[26] Although musical compositions had been eligible for copyright protection since the Copyright Act of 1831, when the Supreme Court was called upon to examine the player-piano roll, it determined that it did not represent the same thing as the copyrighted song and, thus, the roll did not infringe the copyright in the musical composition.[27] This problem, among others, led to a major revision of copyright law: the Copyright Act of 1909.[28] The 1909 Act greatly broadened the types of works that could be copyrighted.[29]

Soon after the 1909 Act was adopted, however, more new technologies were invented and entered into the marketplace; this led to a series of amendments throughout the 1900s. For example, amendments passed in 1912 addressed radio broadcasts[30] of musical compositions[31] and motion pictures.[32] As copyright amendments

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[25] *See, e.g.*, Peter S. Menell & David Nimmer, *Legal Realism in Action: Indirect Copyright Liability's Continuing Tort Framework and Sony's De Facto Demise*, 55 UCLA L. REV. 143 *passim* 2007 (discussing the application of the result reached in Sony Corp. of Am. v. Universal City Studios, Inc., 464 U.S. 417 (1984). The court held that there was no secondary copyright infringement liability for producing Betamax video recorder to other technologies which can be used for duplication.).

[26] As the phonograph was invented in 1877, it represents the earliest of the technologies to be addressed. *See* Mary Bellis, *The Inventions of Thomas Edison*, ABOUT.COM, http://inventors.about.com/library/inventors/bledison.htm (last visited Apr. 28, 2012).

[27] *See* White-Smith Music Pub. Co. v. Apollo Co., 209 U.S. 1 (1908).

[28] *See* Copyright Act of 1909, ch. 320, § 5, 35 Stat. 1075 (repealed in 1976).

[29] *Id.* § 5, 35 Stat. at 1076–77.

[30] Radio was invented in 1895 and moved into commercial exploitation by the early 1900s. *See* Mary Bellis, *The Invention of Radio*, ABOUT.COM, http: //inventors .about.com/od/rstartinventions/a/radio.htm (last visited Apr. 5, 2012).

[31] Metro-Goldwyn-Mayer Distrib. Corp. v. Bijou Theatre Co., 59 F.2d 70, 76 (1st Cir. 1932) ("It is now held that broadcasting musical productions for profit over a radio may constitute an infringement."). Although the copyright in the musical composition was recognized in 1912, it was not until 1971 that the performance of music became copyrightable for the first time. *See* Act of Oct. 15, 1971, Pub. L. No. 92-140, § 1(c), 85 Stat. 391 (Lexis) (codified as amended 17 U.S.C. § 402).

continued to be needed, particularly caused by the increasing pace of technological change, Congress ultimately replaced the 1909 Act in 1976.[33] Within the new act—in addition to updating the law to better address existing technologies[34]—the act addressed new technologies such as the photocopier,[35] television,[36] cable,[37] and computers.[38]

One of the expressed purposes of the 1976 Copyright Act was to prevent each new technical invention from requiring copyright law to be completely reworked.[39] Thus far, the new approach seems to have worked. However, the impact of the Internet and World Wide Web on the effectiveness of the Copyright Act is still being measured. On the

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[32] Act of Aug. 24, 1912, ch. 356, 37 Stat. 488 (Lexis) (amending § 5 of the Copyright Act of 1909 to include "(m)— Motion pictures other than photoplays:"). Motion Pictures were invented in 1888. *See* Mary Bellis, *The Inventions of Thomas Edison*, ABOUT.COM, http://inventors.about.com/library/inventors/bledison.htm (last visited Apr. 5, 2012).

[33] *See* Copyright Act of 1976, Public Law No. 94-553, 90 Stat. 2541 (codified at 17 U.S.C. § § 101 *et seq.).*

[34] *See* 17 U.S.C. § § 115–16 (2006) (establishing compulsory licenses in musical works and establishing common royalties for coin-operated record players).

[35] *Cf. id.* § 108 (authorizing libraries to reproduce works, which would, in general, require the use of a photocopier). The photocopier was invented in 1937. *See* Mary Bellis, *The History of Xerox*, ABOUT.COM, http://inventors.about.com/od /xyzstartinventions/a/xerox.htm (last visited Apr. 5, 2012).

[36] 17 U.S.C. § 112 (authorizing transmitting organization such as television stations to record the broadcast). Television was invented in 1906, but its commercialization did not occur until the late 1940s and early 1950s. *See* Mary Bellis, *Television History*, ABOUT.COM, http://inventors.about.com/od /tstartinventions/a/Television.htm (last visited Apr. 5, 2012).

[37] 17 U.S.C. § 111 (authorizing many secondary transmissions of television broadcasts). The first cable television systems were developed in the late 1940s to allow people living in remote areas to receive television. *See* Mary Bellis, *Cable Television History*, ABOUT.COM, http://inventors.about.com/library/inventors /blcabletelevision.htm (last visited Apr. 5, 2012).

[38] 17 U.S.C. § 117 (establishing computer user's rights to use copyrighted software). The first fully programmable digital computers were operational in the mid-1940s. *See* Mary Bellis, *The History of Computers*, ABOUT.COM, http: //inventors.about.com/library/blcoindex.htm (last visited Apr. 5, 2012).

[39] *See* H. Rep. No. 94-1476, at 6 (1976), *as reprinted in* 1976 U.S.C.C.A.N. 5659, 5664 ("Authors are continually finding new ways of expressing themselves, but it is impossible to foresee the forms that these new expressive methods will take. The bill does not intend either to freeze the scope of copyrightable subject matter at the present stage of communications technology or to allow unlimited expansion into areas completely outside the present congressional intent. Section 102 implies neither that subject matter is unlimited nor that new forms of expression within that general area of subject matter would necessarily be unprotected.").

positive side, the fundamental approach of the act—providing copyright to works fixed in a tangible medium of expression[40]—has worked for technologies invented after 1976 without requiring significant amendments. The new technologies of the past thirty-five years—such as the VCR, personal computer, Internet, CD, and DVD—have not required an amendment to the basic definition of what works are copyrightable. This is not to suggest, however, that new technologies have not challenged the overall effectiveness of the Copyright Act.[41] Obviously, problems have occurred within the practical functioning of the law. With the speed and ease of duplication and distribution provided by the Internet, copyright rights and remedies may not provide any real protection for the author, particularly where music is involved.[42]

What this copyright law history shows is that adaptations of the law in response to technology is hardly novel. The law has had to respond multiple times, and indeed, the speed of the changes is clearly accelerating. New technology means new law.[43]

The articles and notes in this issue of the University of Massachusetts Law Review discuss this interface between technology and the law. Each addresses its own area: controlling the work of a crime laboratory; using GPS systems to prevent repeat domestic violence; engaging in online, virtual arbitration; controlling electronic discovery; and determining the effect of the First Amendment on a student's use of social media. Whether the interest is in these specific topics or on the broader issue of legally addressing new discoveries, the materials within this journal are apropos.

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[40] 17 U.S.C. § 102(a) (2006).

[41] *See generally supra* note 25.

[42] *See, e.g.*, Digital Millennium Copyright Act, 17 U.S.C. § 512 (2006).

[43] Creating new law is not the only effect. New technology will often result in old law becoming irrelevant. When was the last time that a court was required to define what a "bridle-way" is? *See* Flagg v. Flagg, 82 Mass. 175, 178 (1860) (defining a "bridle-way" and distinguishing it from a "drift-way.").