

INTELLECTUAL PROPERTY AND THE INFORMATION ECONOMY

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INTRODUCTION

The pundits who prophesied that the Internet would mean the end of intellectual property were wrong.¹ Intellectual property is alive and well on the Internet. Copyrights, trademarks, and lately even patents are the subjects of vigorous, and increasingly successful, enforcement efforts. From high-tech start-up profiles to law-firm hiring patterns, the evidence suggests that protection of online intellectual property is a growth industry. But this is not, to borrow a turn of phrase, your father's intellectual property. This intellectual property is different. Traditional intellectual property rights, which were limited monopolies operating in distinct and different subject areas, have been retrofitted to become sophisticated, mutually reinforcing methods of controlling information use.

This portrait of the emerging information economy as an interlocking system of information restrictions challenges the widely held perception that, at least as compared with offline activity, online commerce and communication will be relatively frictionless. To be sure, digital network technologies reduce some of the costs associated with offline transactions. Eliminating *all* sources of friction benefits no one, however. (No one, that is, other than the individuals who learn from online information, contribute to online discourse, and consume online services.) From the perspective of the information entrepreneur, profit is all about introducing friction into online commerce. The seamless web is the information entrepreneur's nightmare. As old sources of friction disappear, new sources must be found.²

The intellectual property regime that is emerging on the Internet will do three things: It will allow proprietary control over access to information. It will leverage that control to achieve an astonishingly broad range of restrictions on information use—not only by copyists and other free riders, but also by citizens, consumers, critics, and legitimate competitors. And, as a result, it will reshape the ways in which online interaction is structured. To the extent that it cannot adapt traditional intellectual property law to these tasks, it will harness a serviceable collection of other legal doctrines, both new and old, to assist.

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¹ E.g., Barlow 1995; Dyson 1995.

² Benkler 2000a; Clark and Blumenthal 2000; Lemley and Lessig 2001.

1. COPYRIGHT

Copyright law traditionally has conferred only limited rights on authors and their assignees. These rights included the right to control copying, distribution, and public performance or display of a work containing original expression, but they did not include the right to control access to or private use of an already purchased copy. The copyright owner also had the right to control preparation of most derivative works, but not the right to control fair use derivatives. Finally, copyright has not extended to facts or ideas (which are in the public domain) or processes or methods of operation (which are the province of the patent system, but only if sufficiently innovative).

In the online world, these balances are shifting. As applied to digital works, copyright accords much greater control over access to and use of copyrighted expression. In addition, the major copyright-owning industries have pursued ancillary legislation designed both to make this control more complete and to extend control to uncopyrightable elements of protected works.

Technologies of digital distribution give copyright owners new legal grounds to claim the right to control access and use. In the U.S., courts quickly concluded that the reproduction in RAM that occurs automatically whenever a digital work is accessed constitutes legally cognizable copying.³ If every use of a digital work is an infringement, the copyright owner has a correspondingly stronger claim to control both initial access and any subsequent rendering of the work.⁴ This, in turn, means that copyright also affects the process of searching for and finding information. Because search engines copy, proprietors of search engines must consider carefully how they will index and display Web-based material.

As already noted, copyright law historically has contained limitations and exceptions designed to prevent owners' exclusive rights from becoming access and use rights, and to avoid the concomitant risks of private censorship and enclosure of the public domain. Within the U.S. legal system, the judicially developed fair use doctrine traditionally has excused many unauthorized uses of copyrighted content—e.g., scholarly or critical commentary, parody—on the ground that such uses are socially beneficial.⁵ Thus, for example, the only court to consider a case of alleged infringement by an Internet search engine ruled that creating thumbnail images of indexed sites is fair.⁶ To prevent copyright from regulating competition in markets for

³ *MAI Systems Corp. v. Peak Computer*, 991 F.2d 511 (9th Cir. 1993), *cert. dismissed*, 510 U.S. 1033 (1994); Information Infrastructure Task Force 1995, 64-66.

⁴ Ginsburg 2000.

⁵ This doctrine was codified in the U.S. Copyright Act of 1976, 17 U.S.C. § 107. The U.S. Copyright Act also includes a variety of other, more specific exceptions, including the so-called first sale doctrine, *id.* § 109(a), and special copying privileges for libraries, *id.* § 108.

⁶ *Kelly v. Arriba Soft Corp.*, 77 F. Supp. 2d 1116 (C.D. Cal. 1999), *aff'd in part and rev'd in part*, 280 F.3d 934 (9th Cir. 2002).

uncopyrightable network standards, courts have concluded that reverse engineering to discover otherwise inaccessible interoperability specifications is a fair use.⁷ Within copyright systems patterned on the Continental European model, the copyright owner's exclusive rights typically are counterbalanced by a list of specifically enumerated exceptions authorizing, *inter alia*, news reporting and other commentary and copying for personal, non-commercial use.⁸ The European Union has specifically authorized exceptions for "[t]emporary acts of reproduction . . . which are transient or incidental [and] an integral and essential part of a technological process, and whose sole purpose is to enable: (a) a transmission in a network between third parties by an intermediary, or (b) a lawful use."⁹ It also has authorized an exception for reverse engineering of software that is "necessary to achieve the interoperability of an independently created computer program with other programs."¹⁰

With the advent of digital media technologies and information networks, however, the carefully constructed system of copyright limitations and exceptions is being systematically whittled away. In the U.S., one of the factors relevant to a fair use inquiry is whether the challenged use, if widespread, would affect the potential market for the work.¹¹ Because digital information technologies reduce certain types of transaction costs, they facilitate the creation of new markets for some uses, such as photocopying and music sampling. Several influential court decisions have found significant market harm, and thus no fair use, based solely on copyright owners' stated desire to use digital technologies to create markets for disputed uses that traditionally had been considered fair.¹² In addition, copyright owners have argued, with mixed success, that in light of the ease of copying digital files and the development of new technologies for licensing access and use, the law should no longer excuse personal use copying of digital works, either as fair use or under any other rationale. This expansive "market expectation" test also has been enshrined within international copyright law as a condition for any exception to

⁷ *Sony Computer Entertainment v. Connectix Corp.*, 203 F.3d 596 (9th Cir.), *cert. denied*, 121 S. Ct. 172 (2000); *Sega Enterprises v. Accolade*, 977 F.2d 1510 (9th Cir. 1992).

⁸ The major international copyright treaty reflects elements of both approaches. See Berne Convention for the Protection of Literary and Artistic Works, arts. 9, 10, 10*bis*, <<http://www.law.cornell.edu/treaties/berne/overview/html>>.

⁹ See Directive 2001/29/EC of the European Parliament and of the Council of 22 May 2001 on the harmonization of certain aspects of copyright and related rights in the information society, 2001 O.J. (L 167) 10, art. 5(1), <http://europa.eu.int/eur-lex/en/lif/dat/2001/en_301L0029.html>.

¹⁰ Council Directive 91/250/EEC of 14 May 1991 on the legal protection of computer programs, 91/250, art. 6(1), <http://europa.eu.int/eur-lex/en/lif/dat/1991/en_391L0250.html>.

¹¹ U.S. Copyright Act of 1976, 17 U.S.C. § 107(4).

¹² *Princeton University Press, Inc. v. Michigan Document Services, Inc.*, 99 F.3d 1381 (6th Cir. 1996) (*en banc*); *American Geophysical Union v. Texaco, Inc.*, 60 F.3d 913 (2d Cir. 1994); *Los Angeles Times v. Free Republic*, 54 U.S.P.Q.2d 1453 (C.D. Cal. 2000).

copyright owners' exclusive rights.¹³ A dispute resolution panel of the World Trade Organization recently invoked the test to invalidate a U.S. copyright exception permitting small restaurateurs to play radio and television broadcasts.¹⁴ The decision sets a precedent for the invalidation of other exceptions to copyright that defeat new digital markets. The European Union's new digital copyright directive originally attempted to preserve traditional exceptions allowing copying for personal, non-commercial use.¹⁵ The major copyright industries opposed this language, however, on the ground that any copying represents a potential commercial transaction. As a result, the final version of the directive authorizes such copying only if it is "neither directly nor indirectly commercial" and then only if "the rightholders receive fair compensation."¹⁶

As the foregoing summary suggests, copyright will not do all of this work on its own. In particular, courts and legislatures have resisted efforts to gain control over reverse engineering and other forms of technological innovation. They have declined invitations to invoke copyright to censor parodies and other forms of critical commentary. And although they have cheerfully presided over the narrowing of personal copying privileges, they have refused to declare all personal use copying off limits. Accordingly, the copyright industries have turned to two ancillary regimes of protection.

The first of these ancillary regimes is encryption technology, which restricts initial access to the work and can also be deployed to restrict certain uses, such as copying, that may occur after a reader, listener, or viewer has gained access.¹⁷ Technological access and usage controls may be simple or very complex. In addition to basic copy-control technologies, copyright owners are developing persistent access controls capable of metering and imposing a fractional fee for each act of access and use. Unlike copyright law, any of these technological controls can be applied, as well, to works in the public domain, or to uncopyrightable factual or technical content.

¹³ Under the Berne Convention, the test qualified only exceptions to the reproduction right. Berne Conv. for the Protection of Literary & Artistic Works, art. 9(2). Under the TRIPs agreement, it limits all exceptions. General Agreement on Tariffs and Trade, Annex IC: Agreement on Trade-Related Aspects of Intellectual Property Rights, Including Trade in Counterfeit Goods, art. 13.

¹⁴ Report of the Panel, United States—Section 110(5) of the U.S. Copyright Act, WT/DS160/R No. 00-2284, 15 June 2000, <http://docsonline.wto.org/gen_search.asp>.

¹⁵ Proposal for a European Parliament and Council Directive on the harmonisation of certain aspects of copyright and related rights in the Information Society, 10 December 1997, COM (1997) 628 final, art. 5(2)(b)., <http://europa.eu.int/comm/internal_market/en/intprop/news/copyen.pdf>.

¹⁶ See Directive 2001/29/EC of the European Parliament and of the Council of 22 May 2001 on the harmonization of certain aspects of copyright and related rights in the information society, 2001 O.J. (L 167) 10, art. 5(2)(b), <http://europa.eu.int/eur-lex/en/lif/dat/2001/en_301L0029.html>.

¹⁷ Stefik 1997.

Technologically mediated access regimes also depend to a substantial degree on the conceptual and legal framework of contract law. Copyright law implicitly relies on a divided property-rights framework that gives owners of copies (e.g., books, magazines, etc.) considerable freedom.¹⁸ In a technologically mediated access regime, however, users receive licenses, not ownership of copies, and may use licensed copies only as permitted. The contractual framework also encompasses uses that are difficult to regulate technologically. Copyright owners seeking to prohibit uses permitted by copyright law, such as reverse engineering or critical commentary, are turning to “click-wrap” licenses to implement these restrictions. Together, encryption technologies and contractual restrictions create the potential for enormous flexibility in structuring markets for copyrighted content.

This newer notion of contract, though, departs in two notable ways from the more fluid, open-ended expectations that define offline contracts and distinguish them from other offline interactions. First, the new online contracts are rigid and self-enforcing, and do not recognize or permit negotiation, equitable exceptions or “efficient breach.”¹⁹ Second, the contractual paradigm is all-encompassing; within this vision of the networked information society, there are no extracontractual interactions. Every interaction between user and content is either within or outside the scope of the license.

Neither of these ancillary regimes of protection has proved wholly effective, however. Distribution regimes based on technological access and usage controls and self-enforcing “contracts” will not work if the technologies can be easily circumvented and the contracts are legally unenforceable. The major copyright industries have pursued three types of legislation designed to ensure the optimal background conditions for their techno-contractual regimes of copyright enforcement. The U.S. legal system has been the leader in developing new legal frameworks to facilitate these private supplements to (or overrides of) copyright law.

First, the copyright industries have secured an international commitment to additional legal protection for technological protection regimes. The wording of this commitment, set forth in the 1996 WIPO Copyright Treaty, leaves member states substantial flexibility in implementation.²⁰ In the U.S., the Digital Millennium Copyright Act of 1998 (DMCA) bars circumvention of access control technologies and also forbids the manufacture and distribution of circumvention devices.²¹ Although the DMCA does not forbid circumvention of usage controls (as distinct from access controls) where necessary to engage in conduct allowed by

¹⁸ The theoretical implications of this regime for bargaining in the marketplace between owners of works and owners of chattels embodying those works are underexplored. Cf. Ayres and Talley 1994.

¹⁹ Lessig 1999, 530-31; Radin 2002.

²⁰ “World Intellectual Property Organization Copyright Treaty,” 20 December 1996, art. 11 (“Contracting parties shall provide adequate legal protection and effective legal remedies against the circumvention of” technological protection measures), <<http://www.wipo.int/treaties/ip/wct/index.html>>.

²¹ See U.S. Copyright Act, 17 U.S.C. § 1201(a)-(b).

copyright law, the device ban effectively achieves this result. If persistent access control technologies are in place, moreover, “access” will refer not only to the initial act of authorized access (as with a book that one has purchased), but also to each subsequent rendering of the content.²² Attempts to read or browse without being metered will require the circumvention of access controls using banned technologies, and will be characterized as unlawful “stealing” of access, rather than as lawful browsing or sharing of an already purchased work. The DMCA exempts reverse engineering and certain other kinds of research from the conduct and device bans, but these exemptions are far narrower than the fair use privileges that U.S. copyright law affords.²³

The newly approved European digital copyright directive takes a slightly different approach to the problem of shoring up technological protection regimes. It borrows from the DMCA’s language to define the range of devices that are to be prohibited, but leaves member states free to define what constitutes “adequate legal protection” against the act of circumvention.²⁴ In addition, the directive requires member states to ensure that copyright owners “make available to the beneficiary of exception or limitation provided for in national law . . . the means of benefiting from that exception or limitation.”²⁵ The exceptions and limitations for which accommodation is mandated do not include exceptions for private non-commercial copying; the directive provides only that member states “may” require preservation of those exceptions.²⁶ How the European Union countries will implement these provisions remains to be seen.

Second, copyright interests have sought to conscript third-party online service providers as infringement police. Under U.S. copyright law, the extent of an online service provider’s indirect liability for infringing material posted to the Internet by users is unclear.²⁷ The DMCA creates incentives for online service providers to avoid this inquiry. It includes so-called “safe

²² See U.S. Copyright Office, Exemption to Prohibition on Circumvention of Copyright Protection Systems for Access Control Technologies: Final Rule, 65 Fed. Reg. 64,556, at 64,568 (Oct. 27, 2000) (recognizing this possibility).

²³ U.S. Copyright Act, 17 U.S.C. § 1201(f) (reverse engineering); *id.* § 1201(g) (encryption research); *id.* § 1201(j) (security testing).

²⁴ See Directive 2001/29/EC of the European Parliament and of the Council of 22 May 2001 on the harmonization of certain aspects of copyright and related rights in the information society, 2001 O.J. (L 167) 10, art. 6(1)-(2), <http://europa.eu.int/eur-lex/en/lif/dat/2001/en_301L0029.html>.

²⁵ *Id.* art. 6(4).

²⁶ *Id.*

²⁷ See, e.g., *Religious Technology Center v. Netcom On-Line Communication Services*, 907 F. Supp. 1361 (N.D. Cal. 1995) (identifying fact questions about general-purpose network service provider’s knowledge of and ability to police for infringing conduct); *A&M Records v. Napster*, 239 F.3d 1004 (9th Cir. 2001) (affirming grant of preliminary injunction against provider of software and service for peer-to-peer file exchange but limiting scope of relief to individual works as to which provider is given notice).

harbor” provisions that grant immunity from damage awards contingent on removal of allegedly infringing material upon notification by the copyright owner that the material is present.²⁸ These provisions give copyright owners new, extra-judicial powers to silence creators of unauthorized expression, including fair use expression, and to crack down on personal use copying. Relatedly, copyright interests have waged a legal and legislative campaign against peer-to-peer networking technologies that is expressly intended to prevent the development of new kinds of networks that are not amenable to centralized control. The European Union has authorized its member countries to implement similar laws.²⁹ Several of the European Union member countries are also experimenting with royalty requirements for manufacturers of digital equipment.³⁰

Finally, in the U.S., copyright owners and other Internet entrepreneurs have sought to create a new legal framework for online transactions that would validate the new “click-wrap” contracts. In the U.S., that framework is the Uniform Computer Information Transactions Act (UCITA), which would validate consumer “assent” to these restrictions and legitimize the accompanying technological controls as part and parcel of the agreement.

Even in the U.S., the transformation of copyright law is still incomplete and hotly contested. The fate of UCITA is uncertain; it has been adopted in several states but decisively rejected in others, and several states have proposed “bomb shelter” legislation to protect their citizens from it. In addition, although several court decisions have upheld mass-market restrictions on the use of information products, there remain substantial questions about the extent to which U.S. federal copyright law pre-empts some such restrictions.³¹ The DMCA’s circumvention and device bans also face constitutional challenges grounded in both the Intellectual Property Clause and the First Amendment’s protection for freedom of speech.³² The copyright industries argue that these provisions constrain Congress only minimally in designing the regime of protection best suited to digital information technologies. Advocates of a more limited copyright regime argue that the Constitution requires Congress to exercise a different and more public-regarding sort of leadership within the global intellectual property system.

²⁸ U.S. Copyright Act, 17 U.S.C. § 512.

²⁹ See Directive 2000/31/EC of the European Parliament and of the Council of 8 June 2000 on certain legal aspects of information services, in particular electronic commerce, in the Internal Market (Directive on electronic commerce), 2000 O.J. (L 178) 1, arts. 12-14, <http://europa.eu.int/eur-lex/en/lif/dat/2000/en_300L0031.html>.

³⁰ In 1992, the U.S. adopted a royalty requirement for manufacturers of single-purpose digital audio recording devices, but there has been no serious effort to extend the requirement to other types of equipment. U.S. Copyright Act, 17 U.S.C. §§ 1003-1007.

³¹ The leading decision upholding mass-market restrictions against both contract enforceability and copyright preemption challenges is *ProCD v. Zeidenberg*, 86 F.3d 1447 (7th Cir. 1996). But see *Klocek v. Gateway*, 104 F. Supp. 2d 1332 (D. Kan. 2000) (holding that mass-market restriction does not create binding agreement).

³² See *Universal City Studios v. Reimerdes*, 82 F. Supp. 2d 211 (S.D.N.Y. 2000), *aff’d sub. nom. Universal City Studios v. Corley*, 273 F.3d 429 (2d Cir. 2001) (rejecting First Amendment challenge to DMCA’s device bans but declining to consider whether a First Amendment challenge based on different facts might succeed).

Internationally, debates about the proper scope of protection for copyrighted works are framed in the competing rhetorics of international trade and author's rights, on one hand, and human rights and consumers' rights, on the other, and remain unresolved.

It is plain, however, that the nascent access and usage regime is not frictionless. The sources of friction are simply different. The emerging model of information distribution signals a return to medieval information regimes in which learning was encoded in another tongue and accessible only to those who had the key. Then, the "code" was Latin, and access required both an elite education and physical proximity to a repository of hand-copied manuscripts maintained, in most cases, by the religious orthodoxy. In the emerging "information economy," the code is digital encryption, and access will require both sufficient credit and a sufficiently uncontroversial use.

The new sources of friction, in short, favor purely consumptive uses over productive but potentially disruptive ones. For users accustomed to a more varied framework of public and customary institutions designed to facilitate information access and use—public library patrons, used book purchasers, students, academic researchers, garage entrepreneurs, and so on—persistent access controls threaten to alter substantially the patterns of information flow.³³ The new information economy may be characterized by abundance, but it may not be the sort of abundance that its original architects and prophets envisioned.

2. TRADEMARK AND UNFAIR COMPETITION LAW

Like copyrights, trademark rights traditionally have been incomplete rights. Traditionally, trademark protection attached only to the goods or services with which a mark was used or registered to be used, and only within the geographic area of use. Even then, trademark protection did not entitle the owner to police all uses of a mark, but only those uses that might tend to cause consumer confusion. Thus, with some degree of national variation, one could refer to a mark to criticize the product or the mark owner, to report the news, to advertise a compatible product or service, and so on.

All of this is changing. Trademark rights have broadened considerably in scope, and new legal regimes are evolving to cover those uses to which traditional trademark law will not stretch.

Online, geographic limitations and field-of-use restrictions become conceptually blurry, or so mark owners argue. Because the Internet, and especially the coveted .com domain, do not (yet) recognize geographic boundaries, and because search results often cannot reliably be restricted to particular goods or services, they argue that the potential for consumer confusion is greater and that legal protection for marks should expand accordingly. Some courts have

³³ Cohen 2000.

agreed.³⁴ Developments in the offline world reinforce these arguments. Although some nations, particularly the U.S., retain doctrines that protect local mark owners against remote senior users, local interests increasingly are subordinated to the rationalizing requirements of national and supranational priority systems. And because modern trademarks are licensed to appear on a bewildering variety of promotional items, many of which have little or no relation to the mark owner's core business, courts have accorded mark owners correspondingly broader protection in the merchandising value of their marks.³⁵

Definitions of "confusion," meanwhile, seem limitlessly elastic. Mark owners have advanced, and courts have accepted, creative explanations for attaching liability based on "initial interest confusion" (even if consumers quickly realize that the products or services have distinct sources), "post-sale confusion" on the part of others who may or may not be potential consumers of the product, and even the bare, unsubstantiated possibility of an unspecified affiliation with the mark owner.³⁶ These arguments extend to new forms of creativity and cultural commentary as well. Major entertainment interests have moved to crack down on "fan sites" maintained by devotees of popular entertainers and fictional works, and mark owners of all kinds have displayed a notable lack of humor in responding to jokes, parodies, and satires at their expense.

These expansions in the theoretical and practical scope of trademark liability have important implications for the process by which individuals locate relevant or desired information online. Mark owners charge that competitors' and critics' uses of trademarked terms as searchable metatags or components in domain names (e.g., "disneysucks.com") infringe their trademark rights. This argument has failed in some cases but has succeeded in others.³⁷ To the extent that it succeeds, trademark law erects new obstacles to comparison shopping and new

³⁴ E.g., *GoTo.com v. The Walt Disney Co.*, 202 F.3d 1199 (9th Cir. 2000).

³⁵ Kozinski 1993; Litman 1999.

³⁶ E.g., *Brookfield Communications v. West Coast Entertainment Corp.*, 174 F.3d 1036 (9th Cir. 1999) (initial interest); *Foxworthy v. Custom Tees*, 879 F. Supp. 1200 (N.D. Ga. 1995) ("the fact that some mental process must be performed"); *MGM-Pathé Communications v. The Pink Panther Patrol*, 774 F. Supp. 869 (S.D.N.Y. 1991) (possible inference of ideological support).

³⁷ Courts have found metatext cases relatively challenging. Compare *Brookfield Communications, Inc. v. West Coast Entertainment Corp.*, 174 F.3d 1036 (9th Cir. 1999) (use of competitor's trademark in searchable metatext infringes the mark because it uses the mark to get customers' initial attention), with *Playboy Enterprises, Inc. v. Welles*, 7 F. Supp. 2d 1098 (S.D. Cal.), *affirmed without opinion*, 162 F.3d 1169 (9th Cir. 1998) (descriptive use of "playboy" and "playmate" by former Playmate of the Year not infringement), and *Playboy Enterprises, Inc. v. Netscape Communication Corp.*, 55 F. Supp. 2d 1070 (C.D. Cal. 1999) (search engine's display of advertising by other adult entertainment providers in response to user entry of "playboy" and "playmate" as search terms not infringement, but result might change if service were marketed to competitors based on this capability). In contrast, courts have been relatively resistant to complaints alleging trademark infringement arising out of uses of marks in domain names connected with legitimate unrelated goods or legitimate criticism of the mark owner, see *Hasbro v. Clue Computing*, 232 F.3d 1 (1st Cir. 2000) (per curiam) (use of "clue.com" by computer consulting company did not infringe trademark for mystery game), and *Bally Total Fitness Holding Corp. v. Faber*, 29 F. Supp. 2d 1161 (C.D. Cal. 1998) (use of "ballysucks" in Web address not infringement).

barriers to entry for competitors whose marks are not already household words. Search restrictions also affect protesters and other critics who want to ensure that their sites will be found by a mark owner's customers or shareholders. At the same time, established mark owners are entering agreements designed to funnel individual users to acceptable sites offering "co-branded" content.

Again, however, as in the case of copyright, there are limits to how far trademark doctrine will stretch. Courts have declined to hold that any competitive or critical reference to another's mark might cause confusion. Again, therefore, mark owners have pursued ancillary means of protection to compensate for these perceived deficiencies. "Click-wrap" usage restrictions, described above, readily adapt to the trademark context. In addition, mark owners have sought and received new legal protections, including expanded theories of liability and new third-party enforcement regimes. The cumulative impact of these changes has been especially pronounced within the U.S. trademark system, which traditionally had been much more protective of competitors and critics.

First, laws prohibiting trademark dilution create liability for many uses of trademarks that would not be actionable under a confusion standard, such as uses on noncompeting goods and uses in contexts that the mark owner deems undesirable. Laws prohibiting dilution have long been standard features of many countries' trademark systems. Although the U.S. was relatively late to recognize this theory, it did so in 1995, shortly after the GATT/TRIPS agreement extended international obligations concerning trademark protection to encompass dilution.³⁸

Under dilution theory, marks that are "famous" deserve extra protection against uses that may "blur" or "tarnish" the distinctive associations that consumers make with these marks. Many of the uses against which the U.S. Federal Trademark Dilution Act (FTDA) has been invoked, however, are fundamentally expressive in nature; some express sincere criticisms of the mark owner's products or policies, while others are demonstrations of cultural literacy rather than threats to goodwill. Further, although the FTDA authorizes liability only for commercial uses of famous marks, several courts have held that a use counts as commercial if the offending site links to another site at which goods or services are offered for sale, or if the registrant's ownership prevents the mark owner from acquiring the domain name for itself.³⁹

In the U.S., because neither trademark infringement law nor dilution law enabled the recapture of all domain names that resemble existing trademarks, mark owners also have secured

³⁸ General Agreement on Tariffs and Trade, Annex IC: Agreement on Trade-Related Aspects of Intellectual Property Rights, Including Trade in Counterfeit Goods, art. 16(3), <[http://www2.law.cornell.edu/cgi-bin/foliocgi.exe/gatt/query=*/doc/{t122}?>](http://www2.law.cornell.edu/cgi-bin/foliocgi.exe/gatt/query=*/doc/{t122}?); U.S. Trademark Act, 15 U.S.C. § 1125(c).

³⁹ *Panavision International v. Toeppen*, 141 F.3d 1316 (9th Cir. 1998); *Jews for Jesus v. Brodsky*, 993 F. Supp. 282 (D.N.J. 1998), *aff'd mem.*, 159 F.3d 1351 (3d Cir. 1998); *Planned Parenthood Federation of America v. Bucci*, 42 U.S.P.Q.2d 1430 (S.D.N.Y. 1997), *aff'd mem.*, 152 F.3d 920 (2d Cir. 1998).

passage of “anticybersquatting” legislation.⁴⁰ To prevail under the law, a mark owner must show that the domain name is confusingly similar to or dilutive of the mark and that it was acquired with bad faith intent to profit from the mark. The bad faith inquiry must consider mitigating factors, including “bona fide noncommercial or fair use” by the domain registrant. Nonetheless, courts have found ways to define bad faith broadly. For example, one court held that the fact that the registrant considered selling the domain name to the mark owner indicated bad faith despite evidence that the registrant simply hoped to be able to avoid litigation costs.⁴¹

Finally, mark owners have enlisted network standard-setting and administration organizations to prevent unauthorized uses of words to which they assert proprietary claims. In 1998, as the U.S. government prepared to turn over management of the Internet domain name system to a private not-for-profit corporation, trademark interests lobbied heavily for favorable changes to domain name registration and dispute resolution policies. The official U.S. government documents produced during the transition process emphasized the need to protect trademark interests and concluded that the new entity should exercise caution before creating additional top-level domains to ease the congestion in the .com domain.⁴² Shortly after its formation, the Internet Corporation for Assigned Names and Numbers (ICANN) asked the World Intellectual Property Organization (WIPO) to develop a satisfactory domain name dispute resolution procedure. After nominal consultation with the public, WIPO recommended and ICANN adopted a uniform arbitration procedure designed to protect trademark interests, to which all Internet domain name registrants must accede.⁴³

So far, ICANN’s Uniform Domain Name Dispute Resolution Policy—in which decisions are rendered by an arbitration provider and panelist selected by the complaining party—has produced results dramatically tilted in favor of mark owners.⁴⁴ The criteria for transferring a domain to a complainant are similar to those set forth in the U.S. anticybersquatting law, but have been applied even more broadly. Arbitration panelists have ordered the surrender even of domain names that are clearly (and unconfusingly) critical of the mark owner. For example, one decision concluded that purchase of a “sucks” domain name following a perceived slight is

⁴⁰ U.S. Trademark Act, 15 U.S.C. § 1125(d).

⁴¹ E.g., *Virtual Works v. Volkswagen of America*, 238 F.3d 264 (4th Cir. 2001) (“vw.net”).

⁴² E.g., U.S. Department of Commerce, National Telecommunications and Information Administration, *Management of Internet Names and Addresses: Statement of Policy* (5 June 1998), 11-13, <http://www.ntia.doc.gov/ntiahome/domainname/6_5_98dns.htm>.

⁴³ Internet Corporation for Assigned Names & Numbers (ICANN), Uniform Domain Name Dispute Resolution Policy (26 August 1999), <<http://www.icann.org/udrp/udrp-policy-24oct99.htm>>; ICANN; Rules for Uniform Domain Name Dispute Resolution Policy (24 October 1999), <<http://www.icann.org/udrp/udrp-rules-24oct99.htm>>. On the WIPO process, see Froomkin 1999.

⁴⁴ Mueller 2000.

“retaliatory” and therefore in bad faith;⁴⁵ another concluded that so-called warehousing of critical domain names demonstrates the requisite bad faith intent to profit.⁴⁶

The emerging regime of online trademark protection has ambitions that stray rather far from trademark law’s original purpose of ensuring fair competition. On the Internet, words that have trademark significance may retain that significance; but they also may serve as tools that enable individuals to search for and locate a variety of content ranging from information about similar or analogous goods and services to cultural commentary. Changes in the rules that govern who may use what terms, and how, portend larger changes in the operation of the network as a mechanism for information retrieval and commercial and social interaction. Once again, many of these changes serve to increase friction, not to reduce it.

3. MISAPPROPRIATION

Although both copyright and trademark rights have expanded significantly in the past decade, neither copyright nor trademark law protects raw data. Many providers of “pure” information, however, believe that comparable protection is warranted in an online world in which rapidly evolving derivative or ancillary information services are the norm. Accordingly, the information industries have sought broader statutory protection for databases and their contents. As in the case of trademark law, non-U.S. legal systems have proved more responsive to industry demands for new, *sui generis* intellectual property rights in databases. In the U.S., database proprietors have made creative use of common law doctrines developed to protect physical property against unauthorized invasion.

In 1996, after sustained lobbying by the information industries, the European Parliament adopted a directive requiring that member states grant property rights to database proprietors.⁴⁷ The directive establishes a fifteen-year exclusive right to control reproduction, distribution, adaptation, and communication to the public of all or part of a protected database.⁴⁸ European Union member states may grant exceptions, but (as in the case of copyright) may not interfere with the database owner’s legitimate market expectations.⁴⁹ In particular, they may not grant rights to reproduce any part of a protected database in electronic form, even for personal, non-commercial use, and may not grant rights to engage in “repeated and systematic extraction

⁴⁵ *Diageo plc v. John Zuccarini*, WIPO Arbitration & Mediation Center Case No. D2000-0996 (22 October 2000).

⁴⁶ *Wal-Mart Stores, Inc. v. Richard MacLeod d/b/a For Sale*, WIPO Arbitration and Mediation Center Case No. D2000-0662 (19 September 2000).

⁴⁷ Directive 96/9/EC of the European Parliament and of the Council of 11 March 1996 on the legal protection of databases, 1996 O.J. (L 77) 20, <http://europa.eu.int/eur-lex/en/lif/dat/1996/en_396L0009.html>.

⁴⁸ *Id.*, art. 5.

⁴⁹ *Id.*, arts. 6(3), 7(5).

and/or re-utilization of insubstantial parts” of the database.⁵⁰ Unlike previous legal instruments relating to intellectual property protection, the database directive authorizes protection for nationals of non-European Union countries only if their home countries would accord European Union nationals comparable protection.⁵¹ Most European Union countries have now passed implementing legislation, and courts have begun to issue decisions in favor of right-holders.⁵²

Parallel attempts by the information industries to secure an international database protection treaty were unsuccessful, however. In 1995, the World Intellectual Property Organization began considering proposals for a treaty that would establish standards for legal protection of databases. At its 1996 drafting convention, the WIPO Committee of Experts proposed a treaty that largely tracked the provisions of the European Directive.⁵³ The treaty was swiftly withdrawn from consideration after it encountered strong opposition both from developing nations and from non-governmental organizations.⁵⁴

Ongoing efforts to secure federal database legislation within the U.S. also have encountered obstacles. First, proponents of federal database legislation have had to address preemption-related issues. In the U.S., the common law right against misappropriation has been characterized as quasi-property.⁵⁵ It is a right to prevent use of information, but only certain kinds of time-sensitive information, and only by direct competitors. In part, the scope of the tort depends upon judicially determined standards of commercial morality. In part, however, it is a function of federal intellectual property policy. The federal Copyright Act expressly preempts state-created rights that are “equivalent” to those afforded by copyright law.⁵⁶ State-granted property rights in facts would violate this provision, which extends to all subject matter governed by the Copyright Act, including subject matter that the Act expressly places in the public domain.⁵⁷

Many legal commentators believe that the preemption problems associated with database protection are of constitutional stature, and therefore constrain not only the states but also

⁵⁰ Id., arts. 6(2)(a), 7(5).

⁵¹ Id., ¶ 56.

⁵² Hugenholtz 2001.

⁵³ World Intellectual Property Organization, “Basic Proposal for the Substantive Provisions of the Treaty on Intellectual Property in Respect of Databases to Be Considered by the Diplomatic Conference,” (30 August 1996).

⁵⁴ Samuelson and Browning 1997.

⁵⁵ *International News Service v. Associated Press*, 248 U.S. 215 (1918).

⁵⁶ U.S. Copyright Act, 17 U.S.C. § 301(a).

⁵⁷ *National Basketball Association v. Motorola*, 105 F.3d 841 (2d Cir. 1997).

Congress.⁵⁸ The Intellectual Property Clause of the Constitution is the only clause that empowers Congress to grant “exclusive rights,” and only in subject matter that is either patentable or copyrightable.⁵⁹ By necessary implication, then, Congress may not invoke its general authority to regulate interstate commerce to grant exclusive rights in some other subject matter. Congress may regulate unfair competition relating to databases, but the rights that it grants to database proprietors may not be property rights. In addition, a surprisingly broad array of interests has opposed strong database protection on the grounds that, preempted or not, granting broad rights in collections of facts would enable privatization of the public domain and severely disadvantage research, education, and innovation.⁶⁰ As a result of this opposition, the 104th, 105th, and 106th Congresses passed without enactment of federal database protection.⁶¹ It is too early to predict whether the 107th Congress will prove different.

Undeterred by these failures on the legislative front, proponents of increased protection for databases have turned to the law of physical property for assistance.⁶² For those who seek to control access to content that they maintain online, the common law of property furnishes a different and readily accessible set of principles for specifying what is “mine” and “not mine.”⁶³ These principles focus not on content per se, but on the attributes of the Web server that houses the content as “property.” The terminology commonly applied to Web-based collections of information—“sites”—lends itself to this metaphoric approach. In the process, an entirely different set of normative tropes also comes into play. To access “property,” real or personal, requires permission. Property owners may grant easements, but easements can be and usually are limited in scope. On this reasoning, an easement granted to individual members of the public to access Web-based data no more implies permission to one’s competitors than an easement for foot traffic through one’s field implies permission to use the path for off-road vehicles.

Proponents of increased protection for computer-based information also have sought recourse under the federal Computer Fraud and Abuse Act (CFAA).⁶⁴ The CFAA adopts and

⁵⁸ Benkler 2000b, 548-52; Cohen 1998, 1131-32; Patry 1999.

⁵⁹ U.S. Constitution, art. I, sec. 8, cl. 8; *The Trade-Mark Cases*, 100 U.S. 82 (1879).

⁶⁰ Reichman and Samuelson 1997.

⁶¹ *Database Investment and Intellectual Property Antipiracy Act*, 104th Cong., 2nd sess., H.R. 3531 (1996); *Collections of Information Antipiracy Act*, 105th Cong., 1st sess. H.R. 2652 (1997); *Collections of Information Antipiracy Act*, 106th Cong., 1st sess., H.R. 354 (1999); see also *Consumer and Investor Access to Information Act*, 106th Cong., 1st sess. H.R. 1858 (1999) (alternate bill backed by opponents of H.R. 354).

⁶² *eBay v. Bidders’ Edge*, 100 F. Supp. 2d 1058 (N.D. Cal. 2000), *appeal dismissed* (2001); *Register.com v. Verio*, 126 F. Supp. 2d 238 (S.D.N.Y. 2000), *appeal pending* (2d Cir.).

⁶³ Information Infrastructure Task Force 1995, p. 205 (recommending that schoolchildren be taught that it is wrong to copy information stored on a computer system).

⁶⁴ *Register.com v. Verio*, 126 F. Supp. 2d 238 (S.D.N.Y. 2000), *appeal pending* (2d Cir.).

extends the real property analogy; it treats “unauthorized access” to computers as the digital equivalent of “burglary,” a breaking and entering deemed criminal even when nothing has actually been broken.⁶⁵ Extension of the burglary metaphor to encompass unauthorized (or simply undesired) methods of gathering publicly accessible data strains the metaphor to the breaking point, however. Taken to its logical conclusion, the argument would suggest that nearly any ordinary use of the Internet could violate the statute.

Even absent intellectual property protection for databases, then, resort to legal principles developed for tangible property is creating a strong right against unauthorized access to Web-based information. This new right exists independently of federal intellectual property policy, and protects even owners of free, publicly accessible sites against conduct that is not to their liking. Proprietors of Web-based services say that they do not wish to exclude their customers, nor to stifle fair competition, but only to protect themselves against competitors who are free-riding on their efforts. The line between free-riding and innovation, however, is the subject of considerable dispute. Unlike the misappropriation tort or even a (hypothetical, more restrained) database protection statute, property rights are not easily tailored to recognize the difference.⁶⁶

More generally, application of the real property metaphor to Web servers re-introduces the sorts of friction that prevent comparison shopping, research, and the formation of informed opinions in the offline world.⁶⁷ As a practical matter, data aggregation is far more difficult when one must negotiate a separate permissions process, or conduct separate pricing inquiries, for each vendor. While the emergence of licensed intermediaries may mitigate these costs, intermediation introduces other costs. Whatever one may think about whether this would represent good policy, it seriously compromises the vision of the Internet as a relatively seamless web of commerce, competition, and communication.

4. PATENTS

In the offline world, patents traditionally have been available only for industrial innovation. Subject to rules of commercial fair play, such as those forbidding theft of trade secrets, other sorts of useful innovation were considered fair game to be copied and improved upon. Patent law respected the boundaries that separated applied sciences and technology from theoretical science, on the one hand, and from commerce, on the other. Long-standing judicially developed doctrines precluded, for example, patent protection for mathematical formulae, mental processes, and methods of doing business.⁶⁸ In a post-industrial age, however, the barriers that separated patentable from unpatentable subject matter are crumbling. Here again, as with copyright, the U.S. patent system is leading the way.

⁶⁵ U.S. Computer Fraud & Abuse Act, 18 U.S.C. § 1030.

⁶⁶ Burk 2000.

⁶⁷ O’Rourke 2000.

⁶⁸ See, e.g., Samuelson 1990; Thomas 1999.

Within the U.S. patent system, the new, “post-industrial” patents regulate everything from methods of doing business to methods of online interaction.⁶⁹ The U.S. Court of Appeals for the Federal Circuit (CAFC), which has exclusive jurisdiction over patent appeals, has decreed that an invention will be patentable if it accomplishes “a useful, concrete, and tangible result,” even if that result is simply “the transformation of data.”⁷⁰ In two landmark decisions, the CAFC upheld patents on a profit allocation system for financial accounts and a method of generating billing records.⁷¹ In response, the U.S. Patent & Trademark Office has issued patents for non-technological innovations ranging from the grandiose (a model for economic privatization) to the banal (a method of targeting Internet banner advertising to users) to the simply incomprehensible (a method of painting using an infant’s posterior).⁷² Although the CAFC recently cast doubt on the validity of one of the most celebrated (or notorious) of the new post-industrial patents,⁷³ many others are being litigated and many more settled to avoid the potentially ruinous costs of patent litigation. Despite insistent criticism from legal commentators and policy analysts, the U.S. Supreme Court has determinedly avoided reviewing a case that might require it to define the legitimate scope of the patent system.

The rapid expansion of the patent system has engendered resistance, however. Within the U.S., a rising level of disgust has prompted limited procedural reforms designed to enable interested parties to submit relevant prior art and request that the Patent Office order re-examination of issued patents.⁷⁴ Proposed legislation would create an opportunity to directly oppose issued patents, and would erect additional substantive hurdles to the issuance of patents for computer-implemented innovations.⁷⁵ Private parties also have gotten into the act, offering bounties and other incentives for prior art that would invalidate these patents.⁷⁶ Internationally, some patent systems, including the European Patent Office, have expressly declined to extend

⁶⁹ This terminology is borrowed from Thomas 2001.

⁷⁰ *State Street Bank & Trust v. Signature Financial Group*, 149 F.3d 1368, 1373 (Fed. Cir. 1998), *cert. denied*, 525 U.S. 1093 (1999).

⁷¹ *Id.*; *AT&T Corp. v. Excel Communications*, 172 F.3d 1352 (Fed. Cir. 1999).

⁷² Thomas 2001, 3-8, 20-23.

⁷³ *Amazon.com v. Barnesandnoble.com*, 239 F.3d 1343 (Fed. Cir. 2001) (vacating preliminary injunction based on “one-click ordering” patent).

⁷⁴ U.S. Patent Act, 35 U.S.C. §§ 122(b), 301-317.

⁷⁵ *Business Method Patent Improvement Act of 2001*, 107th Cong., 1st sess., H.R. 1332 (2001); *Patent Improvement Act of 2001*, 107th Cong., 1st sess., H.R. 1333 (2001).

⁷⁶ See <<http://www.bountyquest.com>>.

coverage to business methods and other post-industrial subject matter.⁷⁷ The European Commission has proposed a directive that would allow software patents only for inventions of a technical nature, but not for business methods.⁷⁸

Because the parameters of post-industrial patenting practice are still uncertain, it is too early to gauge the impact of post-industrial patenting on the emerging information economy. The qualms of international and domestic critics notwithstanding, some expansion of patentable subject matter may be sensible, or at least inevitable. In an Internet age, conceptions of what is “useful” may differ from those held in previous eras. Nonetheless, it is worth recognizing that post-industrial patents differ from industrial patents in important ways. No previous patent regime held the potential to vest private parties with a comparable degree of control over the content of commerce, competition, and communication. A generous standard of patentability will substantially reinforce trends in other areas of intellectual property law, and will further hasten the transformation of the Internet to a system of gateways, permissions, and tolls.

5. CONCLUSION

Together, traditional intellectual property doctrines and modern supplements to these doctrines are accomplishing the transformation of the Internet from an open to a gated network. As described above, some attempts to modify the traditional doctrines and the carefully constructed balance that they impose have encountered resistance. Nonetheless, enough has changed to make clear that the new information economy will look rather different than the old one. By any standard, this shift signifies the failure of one vision of the Internet and the ascendancy of another. The goal of rigidly controlling access and use is at odds with the original vision of the Internet as a seamless medium for communication and information exchange.

These developments raise important policy and normative questions about the value of information access and exchange. Law- and policy-makers have yet to confront these questions in any systematic way. As this overview of the landscape of intellectual property suggests, however, it is precisely *as a system* that changes in intellectual property law and the conditions of intellectual property enforcement should be considered. The system is cohering of its own accord; each change reinforces the others. Development of a comprehensive and internally coherent intellectual property policy basis for evaluating, and perhaps rethinking, the changes is a pressing need.

⁷⁷ See *Pension Benefit Systems Partnership*, Case No. T0931/95, European Patent Board of Technical Appeals (Sept. 8, 2000), <<http://www.european-patent-office.org/dg3/biblio/t950931eu1.htm>>; United Kingdom Patent Office, *Should Patents be Granted for Computer Software or Ways of Doing Business?: The Government's Conclusions* (March 2001), <<http://www.patent.gov.uk/about/consultations/conclusions.htm>>.

⁷⁸ Proposal for a Directive of the European Parliament and of the Council on the patentability of computer-implemented inventions, 11 March 2002, <http://europa.eu.int/eur-lex/en/com/dat/2002/en_502PC0092.html>.

REFERENCES

- Ayres, Ian, and Eric Talley. 1995. Solomonic Bargaining: Dividing a Legal Entitlement to Facilitate Coasean Trade. *Yale Law Journal* 104, no. 5 (March): 1027.
- Barlow, John Perry. 1994. The Economy of Ideas: A Framework for Rethinking Patents and Copyrights in the Digital Age. *Wired*, March, 84.
- Benkler, Yochai. 2000a. Net Regulation: Taking Stock and Looking Forward. *University of Colorado Law Review* 71, no. 4 (Fall): 1203.
- . 2000b. Constitutional Bounds of Database Protection: The Role of Judicial Review in the Creation and Definition of Private Rights in Information. *Berkeley Technology Law Journal* 14, no. 2 (Spring): 535.
- Burk, Dan L. 2000. The Trouble With Trespass. *Journal of Small & Emerging Business Law* 4, no. 1 (spring): 27. <<http://www.clark.edu/org/jsebl/vol4no1.html>>.
- Clark, David D., and Marjory S. Blumenthal. 2000. Rethinking the Design of the Internet: The End to End Arguments vs. the Brave New World (working paper on file with author). Version for submission 10 August 2000 at Telecommunications Policy Research Conference, Alexandria, Virginia. <<http://www.tprc.org/abstracts00/rethinking.pdf>>.
- Cohen, Julie E. 1998. Copyright and the Jurisprudence of Self-Help. *Berkeley Technology Law Journal* 13, no. 3 (fall): 108.
<http://www.law.berkeley.edu/journals/btlj/articles/13_3/Cohen/html/reader.html>.
- . 2000. Copyright and the Perfect Curve. *Vanderbilt Law Review* 53, no. 6 (November): 1799. <<http://www.law.vanderbilt.edu/lawreview/vol536/cohen.pdf>>.
- Dyson, Esther. 1995. Intellectual Value. *Wired*, July, 136.
- Froomkin, A. Michael. 1999. Semi-Private International Rulemaking: Lessons Learned from the WIPO Domain Name Process. Version 2.0 (working paper on file with author), <<http://www.law.miami.edu/~froomkin/articles/TPRC99.pdf>>.
- Ginsburg, Jane C. 2002. From Having Copies to Experiencing Works: The Development of an Access Right in U.S. Copyright Law. In *U.S. Intellectual Property: Law and Policy*, edited by Hugh Hansen (Sweet & Maxwell, forthcoming 2002).
- Hugenholtz, P. Bernt. 2001. The New Database Right: Early Case Law from Europe. <<http://www.ivir.nl/publications/hugenholtz/fordham2001.html>>.

Information Infrastructure Task Force, United States, *Intellectual Property and the National Information Infrastructure: The Report of the Working Group on Intellectual Property Rights* (1995), <<http://www.uspto.gov/web/offices/com/doc/ipnii/index.html>>.

Kozinski, Alex. 1993. Trademarks Unplugged. *New York University Law Review* 68, no. 4 (October): 960.

Lemley, Mark A., and Lawrence Lessig. 2001. The End of End-to-End: Preserving the Architecture of the Internet in the Broadband Era. *UCLA Law Review* 48, no. 4 (April): 925.

Lessig, Lawrence. 1999. The Law of the Horse: What Cyberlaw Might Teach. *Harvard Law Review* 113, no. 2: 501.

Litman, Jessica. 1999. Breakfast With Batman: The Public Interest in the Advertising Age. *Yale Law Journal* 108, no. 7 (May): 1717.

Mueller, Milton. 2000. Rough Justice: A Statistical Assessment of ICANN's Uniform Dispute Resolution Policy (working paper on file with author), <<http://dcc.syr.edu/roughjustice.htm>>.

O'Rourke, Maureen A. 2000. Shaping Competition on the Internet: Who Owns Product and Pricing Information? *Vanderbilt Law Review* 53, no. 6 (November): 1965. <<http://www.law.vanderbilt.edu/lawreview/vol536/orourke.pdf>>.

Patry, William. 1999. The Enumerated Powers Doctrine and Intellectual Property: An Imminent Constitutional Collision. *George Washington Law Review* 67, no. 2 (January): 359.

Radin, Margaret Jane. 2002. Online Standardization and the Integration of Text and Machine. *Fordham Law Review* 70, no. 4 (March): 1125.

Reichman, J.H., and Pamela Samuelson. 1997. Intellectual Property Rights in Data? *Vanderbilt Law Review* 50, no. 1 (January): 51.

Samuelson, Pamela, and John Browning. 1997. Confab Clips Copyright Cartel. *Wired*, March, 61.

Samuelson, Pamela. 1990. *Benson* Revisited: The Case Against Patent Protection for Algorithms and Other Computer Program-Related Inventions. *Emory Law Journal* 39, no. 4 (fall): 1025.

Stefik, Mark. 1997. Shifting the Possible: How Trusted Systems and Digital Property Rights Challenge Us to Rethink Digital Publishing. *Berkeley Technology Law Journal* 12, no. 1 (spring): 137.

Thomas, John R. 1999. The Patenting of the Liberal Professions. *Boston College Law Review* 40, no. 5 (September): 1139.

Thomas, John R. 2001. Post-Industrial Patents and Personal Liberties (working paper on file with author).